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(54) Title: MODIFIED PEPTIDES AS THERAPEUTIC AGENTS (57) Abstract <p>The present invention concerns fusion of Fc domains with biologically active peptides and a process for preparing pharmaceutical agents using biologically active peptides. In this invention, pharmacologically active compounds are prepared by a process comprising: a) selecting at least one peptide that modulates the activity of a protein of interest; and b) preparing a pharmacologic agent comprising an Fc domain covalently linked to at least one amino acid of the selected peptide. Linkage to the vehicle increases the half-life of the peptide, which otherwise would be quickly degraded <i>in vivo</i>. The preferred vehicle is an Fc domain. The peptide is preferably selected by phage display, <i>E. coli</i> display, ribosome display, RNA-peptide screening, or chemical-peptide screening.</p>		

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Modified Peptides as Therapeutic Agents

Background of the Invention

Recombinant proteins are an emerging class of therapeutic agents.

5 Such recombinant therapeutics have engendered advances in protein formulation and chemical modification. Such modifications can protect therapeutic proteins, primarily by blocking their exposure to proteolytic enzymes. Protein modifications may also increase the therapeutic protein's stability, circulation time, and biological activity. A review
10 article describing protein modification and fusion proteins is Francis (1992), Focus on Growth Factors 3:4-10 (Mediscript, London), which is hereby incorporated by reference.

One useful modification is combination with the "Fc" domain of an antibody. Antibodies comprise two functionally independent parts, a
15 variable domain known as "Fab", which binds antigen, and a constant domain known as "Fc", which links to such effector functions as complement activation and attack by phagocytic cells. An Fc has a long serum half-life, whereas an Fab is short-lived. Capon et al. (1989), Nature 337: 525-31. When constructed together with a therapeutic protein, an Fc
20 domain can provide longer half-life or incorporate such functions as Fc receptor binding, protein A binding, complement fixation and perhaps even placental transfer. Id. Table 1 summarizes use of Fc fusions known in the art.

Table 1—Fc fusion with therapeutic proteins

Form of Fc	Fusion partner	Therapeutic implications	Reference
IgG1	N-terminus of CD30-L	Hodgkin's disease; anaplastic lymphoma; T-cell leukemia	U.S. Patent No. 5,480,981
Murine Fcγ2a	IL-10	anti-inflammatory; transplant rejection	Zheng <i>et al.</i> (1995), <i>J. Immunol.</i> 154: 5590-600
IgG1	TNF receptor	septic shock	Fisher <i>et al.</i> (1996), <i>N. Engl. J. Med.</i> 334: 1697-1702; Van Zee, K. <i>et al.</i> (1996), <i>J. Immunol.</i> 156: 2221-30
IgG, IgA, IgM, or IgE (excluding the first domain)	TNF receptor	inflammation, autoimmune disorders	U.S. Pat. No. 5,808,029, issued September 15, 1998
IgG1	CD4 receptor	AIDS	Capon <i>et al.</i> (1989), <i>Nature</i> 337: 525-31
IgG1, IgG3	N-terminus of IL-2	anti-cancer, antiviral	Harvill <i>et al.</i> (1995), <i>Immunotech.</i> 1: 95-105
IgG1	C-terminus of OPG	osteoarthritis; bone density	WO 97/23614, published July 3, 1997
IgG1	N-terminus of leptin	anti-obesity	PCT/US 97/23183, filed December 11, 1997
Human Ig Cy1	CTLA-4	autoimmune disorders	Linsley (1991), <i>J. Exp. Med.</i> 174:561-9

A much different approach to development of therapeutic agents is peptide library screening. The interaction of a protein ligand with its receptor often takes place at a relatively large interface. However, as demonstrated for human growth hormone and its receptor, only a few key residues at the interface contribute to most of the binding energy. Clackson *et al.* (1995), *Science* 267: 383-6. The bulk of the protein ligand merely displays the binding epitopes in the right topology or serves functions unrelated to binding. Thus, molecules of only "peptide" length (2 to 40 amino acids) can bind to the receptor protein of a given large protein ligand. Such peptides may mimic the bioactivity of the large protein ligand ("peptide agonists") or, through competitive binding, inhibit the bioactivity of the large protein ligand ("peptide antagonists").

Phage display peptide libraries have emerged as a powerful method in identifying such peptide agonists and antagonists. See, for example, Scott *et al.* (1990), *Science* 249: 386; Devlin *et al.* (1990), *Science* 249: 404; U.S. Pat. No. 5,223,409, issued June 29, 1993; U.S. Pat. No. 5,733,731, issued March 31, 1998; U.S. Pat. No. 5,498,530, issued March 12, 1996; U.S. Pat. No. 5,432,018, issued July 11, 1995; U.S. Pat. No. 5,338,665, issued August 16, 1994; U.S. Pat. No. 5,922,545, issued July 13, 1999; WO 96/40987, published December 19, 1996; and WO 98/15833, published April 16, 1998 (each of which is incorporated by reference). In such libraries, random peptide sequences are displayed by fusion with coat proteins of filamentous phage. Typically, the displayed peptides are affinity-eluted against an antibody-immobilized extracellular domain of a receptor. The retained phages may be enriched by successive rounds of affinity purification and repropagation. The best binding peptides may be sequenced to identify key residues within one or more structurally related families of peptides. See, e.g., Cwirla *et al.* (1997), *Science* 276: 1696-9, in which two distinct families were identified. The peptide sequences may also suggest which residues may be safely replaced by alanine scanning or by mutagenesis at the DNA level. Mutagenesis libraries may be created and screened to further optimize the sequence of the best binders. Lowman (1997), *Ann. Rev. Biophys. Biomol. Struct.* 26: 401-24.

Structural analysis of protein-protein interaction may also be used to suggest peptides that mimic the binding activity of large protein ligands. In such an analysis, the crystal structure may suggest the identity and relative orientation of critical residues of the large protein ligand, from which a peptide may be designed. See, e.g., Takasaki *et al.* (1997), *Nature Biotech.* 15: 1266-70. These analytical methods may also be used to investigate the interaction between a receptor protein and peptides

selected by phage display, which may suggest further modification of the peptides to increase binding affinity.

Other methods compete with phage display in peptide research. A peptide library can be fused to the carboxyl terminus of the lac repressor and expressed in E. coli. Another E. coli-based method allows display on the cell's outer membrane by fusion with a peptidoglycan-associated lipoprotein (PAL). Hereinafter, these and related methods are collectively referred to as "E. coli display." In another method, translation of random RNA is halted prior to ribosome release, resulting in a library of polypeptides with their associated RNA still attached. Hereinafter, this and related methods are collectively referred to as "ribosome display." Other methods employ chemical linkage of peptides to RNA; see, for example, Roberts & Szostak (1997), Proc. Natl. Acad. Sci. USA, 94: 12297-303. Hereinafter, this and related methods are collectively referred to as "RNA-peptide screening." Chemically derived peptide libraries have been developed in which peptides are immobilized on stable, non-biological materials, such as polyethylene rods or solvent-permeable resins. Another chemically derived peptide library uses photolithography to scan peptides immobilized on glass slides. Hereinafter, these and related methods are collectively referred to as "chemical-peptide screening." Chemical-peptide screening may be advantageous in that it allows use of D-amino acids and other unnatural analogues, as well as non-peptide elements. Both biological and chemical methods are reviewed in Wells & Lowman (1992), Curr. Opin. Biotechnol. 3: 355-62.

Conceptually, one may discover peptide mimetics of any protein using phage display and the other methods mentioned above. These methods have been used for epitope mapping, for identification of critical amino acids in protein-protein interactions, and as leads for the discovery of new therapeutic agents. E.g., Cortese et al. (1996), Curr. Opin. Biotech. 7:

616-21. Peptide libraries are now being used most often in immunological studies, such as epitope mapping. Kreeger (1996), The Scientist 10(13): 19-20.

Of particular interest here is use of peptide libraries and other
5 techniques in the discovery of pharmacologically active peptides. A
number of such peptides identified in the art are summarized in Table 2.
The peptides are described in the listed publications, each of which is
hereby incorporated by reference. The pharmacologic activity of the
peptides is described, and in many instances is followed by a shorthand
10 term therefor in parentheses. Some of these peptides have been modified
(e.g., to form C-terminally cross-linked dimers). Typically, peptide
libraries were screened for binding to a receptor for a pharmacologically
active protein (e.g., EPO receptor). In at least one instance (CTLA4), the
peptide library was screened for binding to a monoclonal antibody.

Table 2—Pharmacologically active peptides

Form of peptide	Binding partner/ protein of interest ^a	Pharmacologic activity	Reference
intrapeptide disulfide-bonded	EPO receptor	EPO-mimetic	Wrighton <i>et al.</i> (1996), <i>Science</i> 273: 458-63; U.S. Pat. No. 5,773,569, issued June 30, 1998 to Wrighton <i>et al.</i>
C-terminally cross-linked dimer	EPO receptor	EPO-mimetic	Livnah <i>et al.</i> (1996), <i>Science</i> 273: 464-71; Wrighton <i>et al.</i> (1997), <i>Nature Biotechnology</i> 15: 1261-5; International patent application WO 96/40772, published Dec. 19, 1996
linear	EPO receptor	EPO-mimetic	Naranda <i>et al.</i> (1999), <i>Proc. Natl. Acad. Sci. USA</i> , 96: 7569-74
linear	c-Mpl	TPO-mimetic	Cwirla <i>et al.</i> (1997) <i>Science</i> 276: 1696-9; U.S. Pat. No. 5,869,451, issued Feb. 9, 1999; U.S. Pat. No. 5,932,946, issued Aug. 3, 1999
C-terminally cross-linked dimer	c-Mpl	TPO-mimetic	Cwirla <i>et al.</i> (1997), <i>Science</i> 276: 1696-9
disulfide-linked dimer		stimulation of hematopoiesis ("G-CSF-mimetic")	Paukovits <i>et al.</i> (1984), <i>Hoppe-Seylers Z. Physiol. Chem.</i> 365: 303-11; Laerum <i>et al.</i> (1988), <i>Exp. Hemat.</i> 16: 274-80
alkylene-linked dimer		G-CSF-mimetic	Bhatnagar <i>et al.</i> (1996), <i>J. Med. Chem.</i> 39: 3814-9; Cuthbertson <i>et al.</i> (1997), <i>J. Med. Chem.</i> 40: 2876-82; King <i>et al.</i> (1991), <i>Exp. Hematol.</i> 19:481; King <i>et al.</i> (1995), <i>Blood</i> 86 (Suppl. 1): 309a
linear	IL-1 receptor	inflammatory and autoimmune diseases ("IL-1 antagonist" or "IL-1ra-mimetic")	U.S. Pat. No. 5,608,035; U.S. Pat. No. 5,786,331; U.S. Pat. No. 5,880,096; Yanofsky <i>et al.</i> (1996),

^a The protein listed in this column may be bound by the associated peptide (e.g., EPO receptor, IL-1 receptor) or mimicked by the associated peptide. The references listed for each clarify whether the molecule is bound by or mimicked by the peptides.

			Proc. Natl. Acad. Sci. 93: 7381-6; Akeson <i>et al.</i> (1996), <i>J. Biol. Chem.</i> 271: 30517-23; Wiekzorek <i>et al.</i> (1997), <i>Pol. J. Pharmacol.</i> 49: 107-17; Yanofsky (1996), <i>PNAs</i> , 93:7381-7386.
linear	Facteur thymique serique (FTS)	stimulation of lymphocytes ("FTS-mimetic")	Inagaki-Ohara <i>et al.</i> (1996), <i>Cellular Immunol.</i> 171: 30-40; Yoshida (1984), <i>Int. J. Immunopharmacol.</i> 6:141-6.
intrapeptide disulfide bonded	CTLA4 MAb	CTLA4-mimetic	Fukumoto <i>et al.</i> (1998), <i>Nature Biotech.</i> 16: 267-70
exocyclic	TNF- α receptor	TNF- α antagonist	Takasaki <i>et al.</i> (1997), <i>Nature Biotech.</i> 15:1266-70; WO 98/53842, published December 3, 1998
linear	TNF- α receptor	TNF- α antagonist	Chirinos-Rojas (), <i>J. Imm.</i> , 5621-5626.
intrapeptide disulfide bonded	C3b	inhibition of complement activation; autoimmune diseases ("C3b-antagonist")	Sahu <i>et al.</i> (1996), <i>J. Immunol.</i> 157: 884-91; Morikis <i>et al.</i> (1998), <i>Protein Sci.</i> 7: 619-27
linear	vinculin	cell adhesion processes—cell growth, differentiation, wound healing, tumor metastasis ("vinculin binding")	Adey <i>et al.</i> (1997), <i>Biochem. J.</i> 324: 523-8
linear	C4 binding protein (C4BP)	anti-thrombotic	Linse <i>et al.</i> (1997), <i>J. Biol. Chem.</i> 272: 14658-65
linear	urokinase receptor	processes associated with urokinase interaction with its receptor (e.g., angiogenesis, tumor cell invasion and metastasis); ("UKR antagonist")	Goodson <i>et al.</i> (1994), <i>Proc. Natl. Acad. Sci.</i> 91: 7129-33; International application WO 97/35969, published October 2, 1997
linear	Mdm2, Hdm2	Inhibition of inactivation of p53 mediated by Mdm2 or hdm2; anti-tumor ("Mdm/hdm antagonist")	Picksley <i>et al.</i> (1994), <i>Oncogene</i> 9: 2523-9; Bottger <i>et al.</i> (1997) <i>J. Mol. Biol.</i> 269: 744-56; Bottger <i>et al.</i> (1996), <i>Oncogene</i> 13: 2141-7
linear	p21 ^{WAF1}	anti-tumor by mimicking the activity of p21 ^{WAF1}	Batl <i>et al.</i> (1997), <i>Curr. Biol.</i> 7: 71-80
linear	farnesyl	anti-cancer by preventing	Gibbs <i>et al.</i> (1994), <i>Cell</i>

^b FTS is a thymic hormone mimicked by the molecule of this invention rather than a receptor bound by the molecule of this invention.

linear	transferase Ras effector domain	activation of ras oncogene anti-cancer by inhibiting biological function of the ras oncogene	77:175-178 Moodie et al. (1994), <u>Trends Genet</u> 10: 44-48 Rodriguez et al. (1994), <u>Nature</u> 370:527-532
linear	SH2/SH3 domains	anti-cancer by inhibiting tumor growth with activated tyrosine kinases	Pawson et al (1993), <u>Curr. Biol.</u> 3:434-432 Yu et al. (1994), <u>Cell</u> 76:933-945
linear	p16 ^{INK4}	anti-cancer by mimicking activity of p16; e.g., inhibiting cyclin D-Cdk complex ("p16-mimetic")	Fåhræus et al. (1996), <u>Curr. Biol.</u> 6:84-91
linear	Src, Lyn	inhibition of Mast cell activation, IgE-related conditions, type I hypersensitivity ("Mast cell antagonist")	Stauffer et al. (1997), <u>Biochem.</u> 36: 9388-94
linear	Mast cell protease	treatment of inflammatory disorders mediated by release of tryptase-6 ("Mast cell protease inhibitors")	International application WO 98/33812, published August 6, 1998
linear	SH3 domains	treatment of SH3- mediated disease states ("SH3 antagonist")	Rickles et al. (1994), <u>EMBO J.</u> 13: 5598-5604; Sparks et al. (1994), <u>J.</u> <u>Biol. Chem.</u> 269: 23853- 6; Sparks et al. (1996), <u>Proc. Natl. Acad. Sci.</u> 93: 1540-4
linear	HBV core antigen (HBcAg)	treatment of HBV viral infections ("anti-HBV")	Dyson & Muray (1995), <u>Proc. Natl. Acad. Sci.</u> 92: 2194-8
linear	selectins	neutrophil adhesion; inflammatory diseases ("selectin antagonist")	Martens et al. (1995), <u>J.</u> <u>Biol. Chem.</u> 270: 21129- 36; European patent application EP 0 714 912, published June 5, 1996
linear, cyclized	calmodulin	calmodulin antagonist	Pierce et al. (1995), <u>Molec. Diversity</u> 1: 259- 65; Dedman et al. (1993), <u>J. Biol. Chem.</u> 268: 23025-30; Adey & Kay (1996), <u>Gene</u> 169: 133-4
linear, cyclized-	integrins	tumor-homing; treatment for conditions related to integrin-mediated cellular events, including platelet aggregation, thrombosis, wound healing, osteoporosis, tissue repair, angiogenesis (e.g.,	International applications WO 95/14714, published June 1, 1995; WO 97/08203, published March 6, 1997; WO 98/10795, published March 19, 1998; WO 99/24462, published May

		for treatment of cancer), and tumor invasion ("integrin-binding")	20, 1999; Kraft <i>et al.</i> (1999), <i>J. Biol. Chem.</i> 274: 1979-1985
cyclic, linear	fibronectin and extracellular matrix components of T cells and macrophages	treatment of inflammatory and autoimmune conditions	WO 98/09985, published March 12, 1998
linear	somatostatin and cortistatin	treatment or prevention of hormone-producing tumors, acromegaly, giantism, dementia, gastric ulcer, tumor growth, inhibition of hormone secretion, modulation of sleep or neural activity	European patent application 0 911 393, published April 28, 1999
linear	bacterial lipopolysac- charide	antibiotic; septic shock; disorders modulatable by CAP37	U.S. Pat. No. 5,877,151, issued March 2, 1999
linear or cyclic, including D- amino acids	pardaxin, mellitin	antipathogenic	WO 97/31019, published 28 August 1997
linear, cyclic	VIP	impotence, neurodegenerative disorders	WO 97/40070, published October 30, 1997
linear	CTLs	cancer	EP 0 770 624, published May 2, 1997
linear	THF-gamma2		Burnstein (1988), <i>Biochem.</i> , 27:4066-71.
linear	Amylin		Cooper (1987), <i>Proc.</i> <i>Natl. Acad. Sci.</i> , 84:8628-32.
linear	Adrenomedullin		Kitamura (1993), <i>BBRC.</i> 192:553-60.
cyclic, linear	VEGF	anti-angiogenic; cancer, rheumatoid arthritis, diabetic retinopathy, psoriasis ("VEGF antagonist")	Fairbrother (1998), <i>Biochem.</i> , 37:17754- 17764.
cyclic	MMP	inflammation and autoimmune disorders; tumor growth ("MMP inhibitor")	Koivunen (1999), <i>Nature</i> <i>Biotech.</i> , 17:768-774.
	HGH fragment		U.S. Pat. No. 5,869,452
	Echistatin	inhibition of platelet aggregation	Gan (1988), <i>J. Biol.</i> <i>Chem.</i> , 263:19827-32.
linear	SLE autoantibody	SLE	WO 96/30057, published October 3, 1996
	GD1alpha	suppression of tumor metastasis	Ishikawa <i>et al.</i> (1998), <i>FEBS Lett.</i> 441 (1): 20-4
	antiphospholipid	endothelial cell activation ,	Blank <i>et al.</i> (1999), <i>Proc.</i>

	beta-2-glycoprotein-I (β 2GPI) antibodies	antiphospholipid syndrome (APS), thromboembolic phenomena, thrombocytopenia, and recurrent fetal loss	Natl. Acad. Sci. USA 96: 5164-8
linear	T Cell Receptor beta chain	diabetes	WO 96/11214, published April 18, 1996

Peptides identified by peptide library screening have been regarded as "leads" in development of therapeutic agents rather than as therapeutic agents themselves. Like other proteins and peptides, they would be rapidly removed in vivo either by renal filtration, cellular clearance mechanisms in the reticuloendothelial system, or proteolytic degradation. Francis (1992), Focus on Growth Factors 3: 4-11. As a result, the art presently uses the identified peptides to validate drug targets or as scaffolds for design of organic compounds that might not have been as easily or as quickly identified through chemical library screening. Lowman (1997), Ann. Rev. Biophys. Biomol. Struct. 26: 401-24; Kay et al. (1998), Drug Disc. Today 3: 370-8. The art would benefit from a process by which such peptides could more readily yield therapeutic agents.

Summary of the Invention

The present invention concerns a process by which the in vivo half-life of one or more biologically active peptides is increased by fusion with a vehicle. In this invention, pharmacologically active compounds are prepared by a process comprising:

- a) selecting at least one peptide that modulates the activity of a protein of interest; and
- b) preparing a pharmacologic agent comprising at least one vehicle covalently linked to at least one amino acid sequence of the selected peptide.

The preferred vehicle is an Fc domain. The peptides screened in step (a) are preferably expressed in a phage display library. The vehicle and the

peptide may be linked through the N- or C-terminus of the peptide or the vehicle, as described further below. Derivatives of the above compounds (described below) are also encompassed by this invention.

The compounds of this invention may be prepared by standard
5 synthetic methods, recombinant DNA techniques, or any other methods of preparing peptides and fusion proteins. Compounds of this invention that encompass non-peptide portions may be synthesized by standard organic chemistry reactions, in addition to standard peptide chemistry reactions when applicable.

10 The primary use contemplated is as therapeutic or prophylactic agents. The vehicle-linked peptide may have activity comparable to—or even greater than—the natural ligand mimicked by the peptide. In addition, certain natural ligand-based therapeutic agents might induce antibodies against the patient's own endogenous ligand; the vehicle-linked
15 peptide avoids this pitfall by having little or typically no sequence identity with the natural ligand.

Although mostly contemplated as therapeutic agents, compounds of this invention may also be useful in screening for such agents. For example, one could use an Fc-peptide (e.g., Fc-SH2 domain peptide) in an
20 assay employing anti-Fc coated plates. The vehicle, especially Fc, may make insoluble peptides soluble and thus useful in a number of assays.

The compounds of this invention may be used for therapeutic or prophylactic purposes by formulating them with appropriate pharmaceutical carrier materials and administering an effective amount to
25 a patient, such as a human (or other mammal) in need thereof. Other related aspects are also included in the instant invention.

Numerous additional aspects and advantages of the present invention will become apparent upon consideration of the figures and detailed description of the invention.

Brief Description of the Figures

Figure 1 shows a schematic representation of an exemplary process of the invention. In this preferred process, the vehicle is an Fc domain, which is linked to the peptide covalently by expression from a DNA construct encoding both the Fc domain and the peptide. As noted in
5 Figure 1, the Fc domains spontaneously form a dimer in this process.

Figure 2 shows exemplary Fc dimers that may be derived from an IgG1 antibody. "Fc" in the figure represents any of the Fc variants within the meaning of "Fc domain" herein. "X¹" and "X²" represent peptides or
10 linker-peptide combinations as defined hereinafter. The specific dimers are as follows:

A, D: Single disulfide-bonded dimers. IgG1 antibodies typically have two disulfide bonds at the hinge region between the constant and variable domains. The Fc domain in Figures 2A and 2D may be formed by
15 truncation between the two disulfide bond sites or by substitution of a cysteinyl residue with an unreactive residue (e.g., alanyl). In Figure 2A, the Fc domain is linked at the amino terminus of the peptides; in 2D, at the carboxyl terminus.

B, E: Doubly disulfide-bonded dimers. This Fc domain may be
20 formed by truncation of the parent antibody to retain both cysteinyl residues in the Fc domain chains or by expression from a construct including a sequence encoding such an Fc domain. In Figure 2B, the Fc domain is linked at the amino terminus of the peptides; in 2E, at the carboxyl terminus.

25 C, F: Noncovalent dimers. This Fc domain may be formed by elimination of the cysteinyl residues by either truncation or substitution. One may desire to eliminate the cysteinyl residues to avoid impurities formed by reaction of the cysteinyl residue with cysteinyl residues of other

proteins present in the host cell. The noncovalent bonding of the Fc domains is sufficient to hold together the dimer.

Other dimers may be formed by using Fc domains derived from different types of antibodies (e.g., IgG2, IgM).

5 Figure 3 shows the structure of preferred compounds of the invention that feature tandem repeats of the pharmacologically active peptide. Figure 3A shows a single chain molecule and may also represent the DNA construct for the molecule. Figure 3B shows a dimer in which the linker-peptide portion is present on only one chain of the dimer. Figure 3C
10 shows a dimer having the peptide portion on both chains. The dimer of Figure 3C will form spontaneously in certain host cells upon expression of a DNA construct encoding the single chain shown in Figure 3A. In other host cells, the cells could be placed in conditions favoring formation of dimers or the dimers can be formed in vitro.

15 Figure 4 shows exemplary nucleic acid and amino acid sequences (SEQ ID NOS: 1 and 2, respectively) of human IgG1 Fc that may be used in this invention.

Figure 5 shows a synthetic scheme for the preparation of PEGylated peptide 19 (SEQ ID NO: 3).

20 Figure 6 shows a synthetic scheme for the preparation of PEGylated peptide 20 (SEQ ID NO: 4).

Figure 7 shows the nucleotide and amino acid sequences (SEQ ID NOS: 5 and 6, respectively) of the molecule identified as "Fc-TMP" in Example 2 hereinafter.

25 Figure 8 shows the nucleotide and amino acid sequences (SEQ. ID. NOS: 7 and 8, respectively) of the molecule identified as "Fc-TMP-TMP" in Example 2 hereinafter.

Figure 9 shows the nucleotide and amino acid sequences (SEQ. ID. NOS: 9 and 10, respectively) of the molecule identified as "TMP-TMP-Fc" in Example 2 hereinafter.

Figure 10 shows the nucleotide and amino acid sequences (SEQ. ID. NOS: 11 and 12, respectively) of the molecule identified as "TMP-Fc" in Example 2 hereinafter.

Figure 11 shows the number of platelets generated in vivo in normal female BDF1 mice treated with one 100 µg/kg bolus injection of various compounds, with the terms defined as follows.

10 PEG-MGDF: 20 kD average molecular weight PEG attached by reductive amination to the N-terminal amino group of amino acids 1-163 of native human TPO, which is expressed in E. coli (so that it is not glycosylated);

15 TMP: the TPO-mimetic peptide having the amino acid sequence IEGPTLRQWLAARA (SEQ ID NO: 13);

TMP-TMP: the TPO-mimetic peptide having the amino acid sequence IEGPTLRQWLAARA-GGGGGGGG-IEGPTLRQWLAARA (SEQ ID NO: 14);

20 PEG-TMP-TMP: the peptide of SEQ ID NO: 14, wherein the PEG group is a 5 kD average molecular weight PEG attached as shown in Figure 6;

25 Fc-TMP-TMP: the compound of SEQ ID NO: 8 (Figure 8) dimerized with an identical second monomer (i.e., Cys residues 7 and 10 are bound to the corresponding Cys residues in the second monomer to form a dimer, as shown in Figure 2); and

TMP-TMP-Fc is the compound of SEQ ID NO: 10 (Figure 9) dimerized in the same way as TMP-TMP-Fc except that the Fc domain is attached at the C-terminal end rather than the N-terminal end of the TMP-TMP peptide.

Figure 12 shows the number of platelets generated in vivo in normal BDF1 mice treated with various compounds delivered via implanted osmotic pumps over a 7-day period. The compounds are as defined for Figure 7.

5 Figure 13 shows the nucleotide and amino acid sequences (SEQ. ID. NOS: 15 and 16, respectively) of the molecule identified as "Fc-EMP" in Example 3 hereinafter.

10 Figure 14 shows the nucleotide and amino acid sequences (SEQ ID NOS: 17 and 18, respectively) of the molecule identified as "EMP-Fc" in Example 3 hereinafter.

Figure 15 shows the nucleotide and amino acid sequences (SEQ ID NOS: 19 and 20, respectively) of the molecule identified as "EMP-EMP-Fc" in Example 3 hereinafter.

15 Figure 16 shows the nucleotide and amino acid sequences (SEQ ID NOS: 21 and 22, respectively) of the molecule identified as "Fc-EMP-EMP" in Example 3 hereinafter.

20 Figures 17A and 17B show the DNA sequence (SEQ ID NO: 23) inserted into pCFM1656 between the unique AatII (position #4364 in pCFM1656) and SacII (position #4585 in pCFM1656) restriction sites to form expression plasmid pAMG21 (ATCC accession no. 98113).

25 Figure 18A shows the hemoglobin, red blood cells, and hematocrit generated in vivo in normal female BDF1 mice treated with one 100 µg/kg bolus injection of various compounds. Figure 18B shows the same results with mice treated with 100 µg/kg per day delivered ~~the same dose~~ by 7-day micro-osmotic pump with the EMPs delivered at 100 µg/kg, rhEPO at 30U/mouse. (In both experiments, neutrophils, lymphocytes, and platelets were unaffected.) In these figures, the terms are defined as follows.

Fc-EMP: the compound of SEQ ID NO: 16 (Figure 13) dimerized with an identical second monomer (i.e., Cys residues 7 and 10 are

bound to the corresponding Cys residues in the second monomer to form a dimer, as shown in Figure 2);

EMP-Fc: the compound of SEQ ID NO: 18 (Figure 14) dimerized in the same way as Fc-EMP except that the Fc domain is attached at the C-terminal end rather than the N-terminal end of the EMP peptide.

"EMP-EMP-Fc" refers to a tandem repeat of the same peptide (SEQ ID NO: 20) attached to the same Fc domain by the carboxyl terminus of the peptides. "Fc-EMP-EMP" refers to the same tandem repeat of the peptide but with the same Fc domain attached at the amino terminus of the tandem repeat. All molecules are expressed in E. coli and so are not glycosylated.

Figures 19A and 19B show the nucleotide and amino acid sequences (SEQ ID NOS: 1055 and 1056) of the Fc-TNF- α inhibitor fusion molecule described in Example 4 hereinafter.

Figures 20A and 20B show the nucleotide and amino acid sequences (SEQ ID NOS: 1057 and 1058) of the TNF- α inhibitor-Fc fusion molecule described in Example 4 hereinafter.

Figures 21A and 21B show the nucleotide and amino acid sequences (SEQ ID NOS: 1059 and 1060) of the Fc-IL-1 antagonist fusion molecule described in Example 5 hereinafter.

Figures 22A and 22B show the nucleotide and amino acid sequences (SEQ ID NOS: 1061 and 1062) of the IL-1 antagonist-Fc fusion molecule described in Example 5 hereinafter.

Figures 23A, 23B, and 23C show the nucleotide and amino acid sequences (SEQ ID NOS: 1063 and 1064) of the Fc-VEGF antagonist fusion molecule described in Example 6 hereinafter.

Figures 24A and 24B show the nucleotide and amino acid sequences (SEQ ID NOS: 1065 and 1066) of the VEGF antagonist-Fc fusion molecule described in Example 6 hereinafter.

Figures 25A and 25B show the nucleotide and amino acid sequences (SEQ ID NOS: 1067 and 1068) of the Fc-MMP inhibitor fusion molecule described in Example 7 hereinafter.

Figures 26A and 26B show the nucleotide and amino acid sequences (SEQ ID NOS: 1069 and 1070) of the MMP inhibitor-Fc fusion molecule described in Example 7 hereinafter.

10 Detailed Description of the Invention

Definition of Terms

The terms used throughout this specification are defined as follows, unless otherwise limited in specific instances.

The term "comprising" means that a compound may include additional amino acids on either or both of the N- or C- termini of the given sequence. Of course, these additional amino acids should not significantly interfere with the activity of the compound.

The term "vehicle" refers to a molecule that prevents degradation and/or increases half-life, reduces toxicity, reduces immunogenicity, or increases biological activity of a therapeutic protein. Exemplary vehicles include an Fc domain (which is preferred) as well as a linear polymer (e.g., polyethylene glycol (PEG), polylysine, dextran, etc.); a branched-chain polymer (see, for example, U.S. Patent No. 4,289,872 to Denkenwalter et al., issued September 15, 1981; 5,229,490 to Tam, issued July 20, 1993; WO 93/21259 by Frechet et al., published 28 October 1993); a lipid; a cholesterol group (such as a steroid); a carbohydrate or oligosaccharide; or any natural or synthetic protein, polypeptide or peptide that binds to a salvage receptor. Vehicles are further described hereinafter.

The term "native Fc" refers to molecule or sequence comprising the sequence of a non-antigen-binding fragment resulting from digestion of whole antibody, whether in monomeric or multimeric form. The original immunoglobulin source of the native Fc is preferably of human origin and
5 may be any of the immunoglobulins, although IgG1 and IgG2 are preferred. Native Fc's are made up of monomeric polypeptides that may be linked into dimeric or multimeric forms by covalent (i.e., disulfide bonds) and non-covalent association. The number of intermolecular disulfide bonds between monomeric subunits of native Fc molecules
10 ranges from 1 to 4 depending on class (e.g., IgG, IgA, IgE) or subclass (e.g., IgG1, IgG2, IgG3, IgA1, IgGA2). One example of a native Fc is a disulfide-bonded dimer resulting from papain digestion of an IgG (see Ellison et al. (1982), Nucleic Acids Res. 10: 4071-9). The term "native Fc" as used herein is generic to the monomeric, dimeric, and multimeric forms.

15 The term "Fc variant" refers to a molecule or sequence that is modified from a native Fc but still comprises a binding site for the salvage receptor, FcRn. International applications WO 97/34631 (published 25 September 1997) and WO 96/32478 describe exemplary Fc variants, as well as interaction with the salvage receptor, and are hereby incorporated
20 by reference. Thus, the term "Fc variant" comprises a molecule or sequence that is humanized from a non-human native Fc. Furthermore, a native Fc comprises sites that may be removed because they provide structural features or biological activity that are not required for the fusion molecules of the present invention. Thus, the term "Fc variant" comprises
25 a molecule or sequence that lacks one or more native Fc sites or residues that affect or are involved in (1) disulfide bond formation, (2) incompatibility with a selected host cell (3) N-terminal heterogeneity upon expression in a selected host cell, (4) glycosylation, (5) interaction with complement, (6) binding to an Fc receptor other than a salvage receptor, or

(7) antibody-dependent cellular cytotoxicity (ADCC). Fc variants are described in further detail hereinafter.

The term "Fc domain" encompasses native Fc and Fc variant molecules and sequences as defined above. As with Fc variants and native
5 Fc's, the term "Fc domain" includes molecules in monomeric or multimeric form, whether digested from whole antibody or produced by other means.

The term "multimer" as applied to Fc domains or molecules comprising Fc domains refers to molecules having two or more
10 polypeptide chains associated covalently, noncovalently, or by both covalent and non-covalent interactions. IgG molecules typically form dimers; IgM, pentamers; IgD, dimers; and IgA, monomers, dimers, trimers, or tetramers. Multimers may be formed by exploiting the sequence and resulting activity of the native Ig source of the Fc or by
15 derivatizing (as defined below) such a native Fc.

The term "dimer" as applied to Fc domains or molecules comprising Fc domains refers to molecules having two polypeptide chains associated covalently or non-covalently. Thus, exemplary dimers within the scope of this invention are as shown in Figure 2.

20 The terms "derivatizing" and "derivative" or "derivatized" comprise processes and resulting compounds respectively in which (1) the compound has a cyclic portion; for example, cross-linking between cysteinyl residues within the compound; (2) the compound is cross-linked or has a cross-linking site; for example, the compound has a cysteinyl
25 residue and thus forms cross-linked dimers in culture or in vivo; (3) one or more peptidyl linkage is replaced by a non-peptidyl linkage; (4) the N-terminus is replaced by -NRR¹, NRC(O)R¹, -NRC(O)OR¹, -NRS(O)₂R¹, -NHC(O)NHR, a succinimide group, or substituted or unsubstituted benzyloxycarbonyl-NH-, wherein R and R¹ and the ring substituents are

as defined hereinafter; (5) the C-terminus is replaced by $-C(O)R^2$ or $-NR^3R^4$ wherein R^2 , R^3 and R^4 are as defined hereinafter; and (6) compounds in which individual amino acid moieties are modified through treatment with agents capable of reacting with selected side chains or terminal residues. Derivatives are further described hereinafter.

The term "peptide" refers to molecules of 2 to 40 amino acids, with molecules of 3 to 20 amino acids preferred and those of 6 to 15 amino acids most preferred. Exemplary peptides may be randomly generated by any of the methods cited above, carried in a peptide library (e.g., a phage display library), or derived by digestion of proteins.

The term "randomized" as used to refer to peptide sequences refers to fully random sequences (e.g., selected by phage display methods) and sequences in which one or more residues of a naturally occurring molecule is replaced by an amino acid residue not appearing in that position in the naturally occurring molecule. Exemplary methods for identifying peptide sequences include phage display, *E. coli* display, ribosome display, RNA-peptide screening, chemical screening, and the like.

The term "pharmacologically active" means that a substance so described is determined to have activity that affects a medical parameter (e.g., blood pressure, blood cell count, cholesterol level) or disease state (e.g., cancer, autoimmune disorders). Thus, pharmacologically active peptides comprise agonistic or mimetic and antagonistic peptides as defined below.

The terms "-mimetic peptide" and "-agonist peptide" refer to a peptide having biological activity comparable to a protein (e.g., EPO, TPO, G-CSF) that interacts with a protein of interest. These terms further include peptides that indirectly mimic the activity of a protein of interest, such as by potentiating the effects of the natural ligand of the protein of interest; see, for example, the G-CSF-mimetic peptides listed in Tables 2

and 7. Thus, the term "EPO-mimetic peptide" comprises any peptides that can be identified or derived as described in Wrighton et al. (1996), Science 273: 458-63, Naranda et al. (1999), Proc. Natl. Acad. Sci. USA 96: 7569-74, or any other reference in Table 2 identified as having EPO-mimetic subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The term "TPO-mimetic peptide" comprises peptides that can be identified or derived as described in Cwirla et al. (1997), Science 276: 1696-9, U.S. Pat. Nos. 5,869,451 and 5,932,946 and any other reference in Table 2 identified as having TPO-mimetic subject matter, as well as the U.S. patent application, "Thrombopoietic Compounds," filed on even date herewith and hereby incorporated by reference. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The term "G-CSF-mimetic peptide" comprises any peptides that can be identified or described in Paukovits et al. (1984), Hoppe-Seylers Z. Physiol. Chem. 365: 303-11 or any of the references in Table 2 identified as having G-CSF-mimetic subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The term "CTLA4-mimetic peptide" comprises any peptides that can be identified or derived as described in Fukumoto et al. (1998), Nature Biotech. 16: 267-70. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually

disclosed therein by following the disclosed procedures with different peptide libraries.

The term "-antagonist peptide" or "inhibitor peptide" refers to a peptide that blocks or in some way interferes with the biological activity of the associated protein of interest, or has biological activity comparable to a known antagonist or inhibitor of the associated protein of interest. Thus, the term "TNF-antagonist peptide" comprises peptides that can be identified or derived as described in Takasaki *et al.* (1997), Nature Biotech. 15: 1266-70 or any of the references in Table 2 identified as having TNF-antagonistic subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The terms "IL-1 antagonist" and "IL-1ra-mimetic peptide" comprises peptides that inhibit or down-regulate activation of the IL-1 receptor by IL-1. IL-1 receptor activation results from formation of a complex among IL-1, IL-1 receptor, and IL-1 receptor accessory protein. IL-1 antagonist or IL-1ra-mimetic peptides bind to IL-1, IL-1 receptor, or IL-1 receptor accessory protein and obstruct complex formation among any two or three components of the complex. Exemplary IL-1 antagonist or IL-1ra-mimetic peptides can be identified or derived as described in U.S. Pat. Nos. 5,608,035, 5,786,331, 5,880,096, or any of the references in Table 2 identified as having IL-1ra-mimetic or IL-1 antagonistic subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The term "VEGF-antagonist peptide" comprises peptides that can be identified or derived as described in Fairbrother (1998), Biochem. 37:

17754-64, and in any of the references in Table 2 identified as having VEGF-antagonistic subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

The term "MMP inhibitor peptide" comprises peptides that can be identified or derived as described in Koivunen (1999), Nature Biotech. 17: 768-74 and in any of the references in Table 2 identified as having MMP inhibitory subject matter. Those of ordinary skill in the art appreciate that each of these references enables one to select different peptides than actually disclosed therein by following the disclosed procedures with different peptide libraries.

Additionally, physiologically acceptable salts of the compounds of this invention are also encompassed herein. By "physiologically acceptable salts" is meant any salts that are known or later discovered to be pharmaceutically acceptable. Some specific examples are: acetate; trifluoroacetate; hydrohalides, such as hydrochloride and hydrobromide; sulfate; citrate; tartrate; glycolate; and oxalate.

Structure of compounds

In General. In the compositions of matter prepared in accordance with this invention, the peptide may be attached to the vehicle through the peptide's N-terminus or C-terminus. Thus, the vehicle-peptide molecules of this invention may be described by the following formula I:

I



wherein:

F¹ is a vehicle (preferably an Fc domain);

X¹ and X² are each independently selected from -(L¹)_c-P¹, -(L¹)_c-P¹-(L²)_d-P², -(L¹)_c-P¹-(L²)_d-P²-(L³)_e-P³, and -(L¹)_c-P¹-(L²)_d-P²-(L³)_e-P³-(L⁴)_f-P⁴

}}}

P^1 , P^2 , P^3 , and P^4 are each independently sequences of pharmacologically active peptides;

L^1 , L^2 , L^3 , and L^4 are each independently linkers; and

a , b , c , d , e , and f are each independently 0 or 1, provided that at least one of a and b is 1.

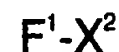
Thus, compound I comprises preferred compounds of the formulae

II



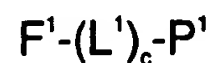
and multimers thereof wherein F^1 is an Fc domain and is attached at the C-terminus of X^1 ;

III



and multimers thereof wherein F^1 is an Fc domain and is attached at the N-terminus of X^2 ;

IV



and multimers thereof wherein F^1 is an Fc domain and is attached at the N-terminus of $-(L^1)_c-P^1$; and

V



and multimers thereof wherein F^1 is an Fc domain and is attached at the N-terminus of $-L^1-P^1-L^2-P^2$.

Peptides. Any number of peptides may be used in conjunction with the present invention. Of particular interest are peptides that mimic the activity of EPO, TPO, growth hormone, G-CSF, GM-CSF, IL-1ra, leptin, CTLA4, TRAIL, TGF- α , and TGF- β . Peptide antagonists are also of interest, particularly those antagonistic to the activity of TNF, leptin, any of the interleukins (IL-1, 2, 3, ...), and proteins involved in complement activation (e.g., C3b). Targeting peptides are also of interest, including

tumor-homing peptides, membrane-transporting peptides, and the like. All of these classes of peptides may be discovered by methods described in the references cited in this specification and other references.

Phage display, in particular, is useful in generating peptides for use
5 in the present invention. It has been stated that affinity selection from libraries of random peptides can be used to identify peptide ligands for any site of any gene product. Dedman et al. (1993), J. Biol. Chem. 268: 23025-30. Phage display is particularly well suited for identifying peptides that bind to such proteins of interest as cell surface receptors or any
10 proteins having linear epitopes. Wilson et al. (1998), Can. J. Microbiol. 44: 313-29; Kay et al. (1998), Drug Disc. Today 3: 370-8. Such proteins are extensively reviewed in Herz et al. (1997), J. Receptor & Signal Transduction Res. 17(5): 671-776, which is hereby incorporated by reference. Such proteins of interest are preferred for use in this invention.

15 A particularly preferred group of peptides are those that bind to cytokine receptors. Cytokines have recently been classified according to their receptor code. See Inglot (1997), Archivum Immunologiae et Therapiae Experimentalis 45: 353-7, which is hereby incorporated by reference. Among these receptors, most preferred are the CKRs (family I in
20 Table 3). The receptor classification appears in Table 3.

Table 3—Cytokine Receptors Classified by Receptor Code

Cytokines (ligands)		Receptor Type	
family	subfamily	family	subfamily
I. Hematopoietic cytokines	1. IL-2, IL-4, IL-7, IL-9, IL-13, IL-15 2. IL-3, IL-5, GM-CSF 3. IL-6, IL-11, IL-12, LIF, OSM, CNTF, leptin (OB) 4. G-CSF, EPO, TPO, PRL, GH 5. IL-17, HVS-IL-17	I. Cytokine R (CKR)	1. shared γ Cr 2. shared GP 140 β R 3. 3.shared RP 130 4. "single chain" R 5. other R ^c
II. IL-10 ligands	IL-10, BCRF-1, HSV-IL-10	II. IL-10 R	
III. Interferons	1. IFN- α , α 2, α 4, m, t, IFN- β ^d 2. IFN- γ	III. Interferon R	1. IFNAR 2. IFNGR
IV. IL-1 ligands	1. IL-1 α , IL-1 β , IL-1Ra	IV. IL-1R	
V. TNF ligands	1. TNF- α , TNF- β (LT), FAS1, CD40 L, CD30L, CD27 L	V. NGF/TNF R ^e	
VI. Chemokines	1. α chemokines: IL-8, GRO α , β , γ , IF-10, PF-4, SDF-1 2. β chemokines: MIP1 α , MIP1 β , MCP-1,2,3,4, RANTES, eotaxin 3. γ chemokines: lymphotactin	VI. Chemokine R	1. CXCR 2. CCR 3. CR 4. DARC'

^c IL-17R belongs to the CKR family but is not assigned to any of the 4 indicated subfamilies.

^d Other IFN type I subtypes remain unassigned. Hematopoietic cytokines, IL-10 ligands and interferons do not possess functional intrinsic protein kinases. The signaling molecules for the cytokines are JAK's, STATs and related non-receptor molecules. IL-14, IL-16 and IL-18 have been cloned but according to the receptor code they remain unassigned.

^e TNF receptors use multiple, distinct intracellular molecules for signal transduction including "death domain" of FAS R and 55 kDa TNF- α R that participates in their cytotoxic effects. NGF/TNF R can bind both NGF and related factors as well as TNF ligands. Chemokine receptors are G protein-coupled, seven transmembrane (7TM, serpentine) domain receptors.

The Duffy blood group antigen (DARC) is an erythrocyte receptor that can bind several different chemokines. It belongs to the immunoglobulin superfamily but characteristics of its signal transduction events remain unclear.

VII. Growth factors	1.1 SCF, M-CSF, PDGF-AA, AB, BB, FLT-3L, VEGF, SSV- PDGF 1.2 FGF α , FGF β 1.3 EGF, TGF- α , VV-F19 (EGF- like) 1.4 IGF-I, IGF-II, Insulin 1.5 NGF, BDNF, NT-3, NT-4 ^o 2. TGF- β 1, β 2, β 3	VII. RKF	1. TK sub-family 1.1 IgTK III R 1.2 IgTK IV R 1.3 Cysteine-rich TK-I 1.4 Cysteine rich TK-II 1.5 Cysteine knot TK V 2. STK subfamily ^h
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Exemplary peptides for this invention appear in Tables 4 through 20 below. These peptides may be prepared by methods disclosed in the art. Single letter amino acid abbreviations are used. The X in these sequences (and throughout this specification, unless specified otherwise in a particular instance) means that any of the 20 naturally occurring amino acid residues may be present. Any of these peptides may be linked in tandem (i.e., sequentially), with or without linkers, and a few tandem-linked examples are provided in the table. Linkers are listed as "Λ" and may be any of the linkers described herein. Tandem repeats and linkers are shown separated by dashes for clarity. Any peptide containing a cysteinyl residue may be cross-linked with another Cys-containing peptide, either or both of which may be linked to a vehicle. A few cross-linked examples are provided in the table. Any peptide having more than one Cys residue may form an intrapeptide disulfide bond, as well; see, for example, EPO-mimetic peptides in Table 5. A few examples of intrapeptide disulfide-bonded peptides are specified in the table. Any of these peptides may be derivatized as described herein, and a few derivatized examples are provided in the table. Derivatized peptides in

^o The neurotrophic cytokines can associate with NGF/TNF receptors also.

the tables are exemplary rather than limiting, as the associated underivatized peptides may be employed in this invention, as well. For derivatives in which the carboxyl terminus may be capped with an amino group, the capping amino group is shown as $-NH_2$. For derivatives in which amino acid residues are substituted by moieties other than amino acid residues, the substitutions are denoted by σ , which signifies any of the moieties described in Bhatnagar *et al.* (1996), *J. Med. Chem.* 39: 3814-9 and Cuthbertson *et al.* (1997), *J. Med. Chem.* 40: 2876-82, which are incorporated by reference. The J substituent and the Z substituents (Z_5 , Z_6 , ... Z_{40}) are as defined in U.S. Pat. Nos. 5,608,035, 5,786,331, and 5,880,096, which are incorporated by reference. For the EPO-mimetic sequences (Table 5), the substituents X_2 through X_{11} and the integer "n" are as defined in WO 96/40772, which is incorporated by reference. The substituents " Ψ ," " Θ ," and "+" are as defined in Sparks *et al.* (1996), *Proc. Natl. Acad. Sci.* 93: 1540-4, which is hereby incorporated by reference. X_4 , X_5 , X_6 , and X_7 are as defined in U.S. Pat. No. 5,773,569, which is hereby incorporated by reference, except that: for integrin-binding peptides, X_1 , X_2 , X_3 , X_4 , X_5 , X_6 , X_7 , and X_8 are as defined in International applications WO 95/14714, published June 1, 1995 and WO 97/08203, published March 6, 1997, which are also incorporated by reference; and for VIP-mimetic peptides, X_1 , X_1' , X_1'' , X_2 , X_3 , X_4 , X_5 , X_6 and Z and the integers m and n are as defined in WO 97/40070, published October 30, 1997, which is also incorporated by reference. Xaa and Yaa below are as defined in WO 98/09985, published March 12, 1998, which is incorporated by reference. AA_1 , AA_2 , AB_1 , AB_2 , and AC are as defined in International application WO 98/53842, published December 3, 1998, which is incorporated by reference. X^1 , X^2 , X^3 , and X^4 in Table 17 only are as defined in European application EP 0 911

^b STKS may encompass many other TGF- β -related factors that remain unassigned. The protein kinases are intrinsic part of the intracellular domain of receptor kinase family (RKF). The enzymes participate in the signals transmission via the receptors.

393, published April 28, 1999. Residues appearing in boldface are D-amino acids. All peptides are linked through peptide bonds unless otherwise noted. Abbreviations are listed at the end of this specification. In the "SEQ ID NO." column, "NR" means that no sequence listing is required

5 for the given sequence.

Table 4—IL-1 antagonist peptide sequences

Sequence/structure	SEQ ID NO:
<u>Z₁₁</u> <u>Z₇</u> <u>Z₈</u> <u>QZ₅</u> <u>YZ₆</u> <u>Z₉</u> <u>Z₁₀</u>	212
XXQZ ₅ YZ ₆ XX	907
Z ₇ XQZ ₅ YZ ₆ XX	908
<u>Z₇</u> <u>Z₈</u> <u>QZ₅</u> <u>YZ₆</u> <u>Z₉</u> <u>Z₁₀</u>	909
<u>Z₁₁</u> <u>Z₇</u> <u>Z₈</u> <u>QZ₅</u> <u>YZ₆</u> <u>Z₉</u> <u>Z₁₀</u>	910
<u>Z₁₂</u> <u>Z₁₃</u> <u>Z₁₄</u> <u>Z₁₅</u> <u>Z₁₆</u> <u>Z₁₇</u> <u>Z₁₈</u> <u>Z₁₉</u> <u>Z₂₀</u> <u>Z₂₁</u> <u>Z₂₂</u> <u>Z₁₁</u> <u>Z₇</u> <u>Z₈</u> <u>QZ₅</u> <u>YZ₆</u> <u>Z₉</u> <u>Z₁₀</u> <u>L</u>	917
<u>Z₂₁</u> <u>NZ₂₄</u> <u>Z₂₅</u> <u>Z₂₆</u> <u>Z₂₇</u> <u>Z₂₈</u> <u>Z₂₉</u> <u>Z₃₀</u> <u>Z₄₀</u>	979
TANVSSFEWTPYYWQPYALPL	213
SWTDYGYWQPYALPISGL	214
ETPFTWEESNAYYWQPYALPL	215
ENTYSPNWADSMYWQPYALPL	216
SVGEDHNFWTSEYWQPYALPL	217
DGYDRWRQSGERYWQPYALPL	218
FEWTPGYWQPY	219
FEWTPGYWQHY	220
FEWTPGWYQJY	221
AcFEWTPGWYQJY	222
FEWTPGWpYQJY	223
FAWTPGYWQJY	224
FEWAPGYWQJY	225
FEWVPGYWQJY	226
FEWTPGYWQJY	227
AcFEWTPGYWQJY	228
FEWTPaWYQJY	229
FEWTPSarWYQJY	230
FEWTPGYYPY	231
FEWTPGWWQPY	232
FEWTPNYWQPY	233
FEWTPvYWQJY	234
FEWTPecGYWQJY	235
FEWTPAibYWQJY	236
FEWTSarGYWQJY	237
FEWTPGYWQPY	238
FEWTPGYWQHY	239
FEWTPGWYQJY	240

AcFEWTPGWYQJY	241
FEWTPGW-pY-QJY	242
FAWTPGYWQJY	243
FEWAPGYWQJY	244
FEWVPGYWQJY	245
FEWTPGYWQJY	246
AcFEWTPGYWQJY	247
FEWTPAWYQJY	248
FEWTPSarWYQJY	249
FEWTPGYYQPY	250
FEWTPGWWQPY	251
FEWTPNYWQPY	252
FEWTPVYWQJY	253
FEWTPecGYWQJY	254
FEWTPAibYWQJY	255
FEWTSarGYWQJY	256
FEWTPGYWQPYALPL	257
1NapEWTPGYYQJY	258
YEWTPGYYQJY	259
FEWVPGYYQJY	260
FEWTPSYYQJY	261
FEWTPNYYQJY	262
TKPR	263
RKSSK	264
RKQDK	265
NRKQDK	266
RKQDKR	267
ENRKQDKRF	268
VTKFYF	269
VTKFY	270
VTDFY	271
SHLYWQPYSVQ	671
TLVYWQPYSLQT	672
RGDYWQPYSVQS	673
VHVVWQPYSVQT	674
RLVYWQPYSVQT	675
SRVWFQPYSLQS	676
NMVYWQPYSIQT	677
SVVFWQPYSVQT	678
TFVYWQPYALPL	679
TLVYWQPYSIQR	680
RLVYWQPYSVQR	681
SPVFWQPYSIQI	682
WIEWWQPYSVQS	683
SLIYWQPYSLQM	684
TRLYWQPYSVQR	685
RCDYWQPYSVQT	686
MRVFWQPYSVQN	687
KIVYWQPYSVQT	688
RHLYWQPYSVQR	689

ALVWWQPYSEI	690
SRVWFQPYSLQS	691
WEQPYALPLE	692
QLVWWQPYSVQR	693
DLRYWQPYSVQV	694
ELVWWQPYSLQL	695
DLVWWQPYSVQW	696
NGNYWQPYSFQV	697
ELVYWQPYSIQR	698
ELMYWQPYSVQE	699
NLLYWQPYSMQD	700
GVEWYQPYSVQR	701
SRVWYQPYSVQR	702
LSEQYQPYSVQR	703
GGGWWQPYSVQR	704
VGRWYQPYSVQR	705
VHVVWQPYSVQR	706
QARWYQPYSVQR	707
VHVVWQPYSVQT	708
RSVWYQPYSVQR	709
TRVWFQPYSVQR	710
GRIWFQPYSVQR	711
GRVWFQPYSVQR	712
ARTWYQPYSVQR	713
ARVWWQPYSVQM	714
RLMFYQPYSVQR	715
ESMWYQPYSVQR	716
HFGWWQPYSVHM	717
ARFWWQPYSVQR	718
RLVYWQ PYAPIY	719
RLVYWQ PYSYQT	720
RLVYWQ PYSLPI	721
RLVYWQ PYSVQA	722
SRVWYQ PYAKGL	723
SRVWYQ PYAQGL	724
SRVWYQ PYAMPL	725
SRVWYQ PYSVQA	726
SRVWYQ PYSLGL	727
SRVWYQ PYAREL	728
SRVWYQ PYSRQP	729
SRVWYQ PYFVQP	730
EYEWYQ PYALPL	731
IPEYWQ PYALPL	732
SRIWWQ PYALPL	733
DPLFWQ PYALPL	734
SRQWVQ PYALPL	735
IRSWWQ PYALPL	736
RGYWQ PYALPL	737
RLLWVQ PYALPL	738
EYRWFQ PYALPL	739

DAYWVQ PYALPL	740
WSGYFQ PYALPL	741
NIEFWQ PYALPL	742
TRDWVQ PYALPL	743
DSSWYQ PYALPL	744
IGNWYQ PYALPL	745
NLRWDQ PYALPL	746
LPEFWQ PYALPL	747
DSYWWQ PYALPL	748
RSQYYQ PYALPL	749
ARFWLQ PYALPL	750
NSYFWQ PYALPL	751
RFMYWQPYSVQR	752
AHLFWQPYSVQR	753
WWQPYALPL	754
YYQPYALPL	755
YFQPYALGL	756
YWYQPYALPL	757
RWWQPYATPL	758
GWYQPYALGF	759
YWYQPYALGL	760
IWYQPYAMPL	761
SNMQPYQRLS	762
TFVYWQPY AVGLPAAETACN	763
TFVYWQPY SVQMTITGKVTM	764
TFVYWQPY SSHXXVPXGFPL	765
TFVYWQPY YGNPQWAIHVRH	766
TFVYWQPY VLLELPEGAVRA	767
TFVYWQPY VDYVWPIPIAQV	768
GWYQPYVDGWR	769
RWEQPYVKDGWS	770
EWYQPYALGWAR	771
GWWQPYARGL	772
LFEQPYAKALGL	773
GWEQPYARGLAG	774
AWVQPYATPLDE	775
MWYQPYSSQPAE	776
GWTQPYSSQQGEV	777
DWFQPYSIQSDE	778
PWIQPYARGFG	779
RPLYWQPYSVQV	780
TLIYWQPYSVQI	781
RFDYWQPYSQDT	782
WHQFVQPYALPL	783
EWDS VYWQPYSVQ TLLR	784
WEQN VYWQPYSVQ SFAD	785
SDV VYWQPYSVQ SLEM	786
YYDG VYWQPYSVQ VMPA	787
SDIWYQ PYALPL	788
QRIWWQ PYALPL	789

SRIWWQ PYALPL	790
RSLYWQ PYALPL	791
TIIWEQ PYALPL	792
WETWYQ PYALPL	793
SYDWEQ PYALPL	794
SRIWCQ PYALPL	795
EIMFWQ PYALPL	796
DYVWQQ PYALPL	797
MDLLVQ WYQPYALPL	798
GSKVIL WYQPYALPL	799
RQGANI WYQPYALPL	800
GGGDEP WYQPYALPL	801
SQLERT WYQPYALPL	802
ETWVRE WYQPYALPL	803
KKGSTQ WYQPYALPL	804
LQARMN WYQPYALPL	805
EPRSQK WYQPYALPL	806
VKQKWR WYQPYALPL	807
LRRHDV WYQPYALPL	808
RSTASI WYQPYALPL	809
ESKEDQ WYQPYALPL	810
EGLTMK WYQPYALPL	811
EGSREG WYQPYALPL	812
VIEWWQ PYALPL	813
VWYWEQ PYALPL	814
ASEWWQ PYALPL	815
FYEWVQ PYALPL	816
EGWWVQ PYALPL	817
WGEWLQ PYALPL	818
DYVWEQ PYALPL	819
AHTWWQ PYALPL	820
FIEWFQ PYALPL	821
WLAWEQ PYALPL	822
VMEWWQ PYALPL	823
ERMWQ PYALPL	824
NXXWXX PYALPL	825
WGNWYQ PYALPL	826
TLYWEQ PYALPL	827
VWRWEQ PYALPL	828
LLWTQ PYALPL	829
SRIWXX PYALPL	830
SDIWYQ PYALPL	831
WGYXX PYALPL	832
TSGWYQ PYALPL	833
VHPYXX PYALPL	834
EHSYFQ PYALPL	835
XXIWYQ PYALPL	836
AQLHSQ PYALPL	837
WANWFQ PYALPL	838
SRLYSQ PYALPL	839

GVTFSQ PYALPL	840
SIVWSQ PYALPL	841
SRDLVQ PYALPL	842
HWGH VYWQPYSVQ DDLG	843
SWHS VYWQPYSVQ SVPE	844
WRDS VYWQPYSVQ PESA	845
TWDA VYWQPYSVQ KWLD	846
TPPW VYWQPYSVQ SLDP	847
YWSS VYWQPYSVQ SVHS	848
YWY QPY ALGL	849
YWY QPY ALPL	850
EWI QPY ATGL	851
NWE QPY AKPL	852
AFY QPY ALPL	853
FLY QPY ALPL	854
VCK QPY LEWC	855
ETPFTWEESNAYYWQPYALPL	856
QGWLTWQDSVDMYWQPYALPL	857
FSEAGYTWPEPTYWQPYALPL	858
TESPGGLDWAKIYWQPYALPL	859
DGYDRWRQSGERYWQPYALPL	860
TANVSSFEWTPGYWQPYALPL	861
SVGEDHNFWTSE YWQPYALPL	862
MNDQTSEVSTFP YWQPYALPL	863
SWSEAFEQPRNL YWQPYALPL	864
QYAEPSALNDWG YWQPYALPL	865
NGDWATADWSNY YWQPYALPL	866
THDEHI YWQPYALPL	867
MLEKTYTTWTPG YWQPYALPL	868
WSDPLTRDADL YWQPYALPL	869
SDAFTTQDSQAM YWQPYALPL	870
GDDAAWRTDSL YWQPYALPL	871
AIIRQLYRWSEM YWQPYALPL	872
ENTYSPNWADSM YWQPYALPL	873
MNDQTSEVSTFP YWQPYALPL	874
SVGEDHNFWTSE YWQPYALPL	875
QTPFTWEESNAY YWQPYALPL	876
ENPFTWQESNAY YWQPYALPL	877
VTPFTWEDSNVF YWQPYALPL	878
QIPFTWEQSNAY YWQPYALPL	879
QAPLTWQESAAY YWQPYALPL	880
EPTFTWEESKAT YWQPYALPL	881
TTTLTWEEESNAY YWQPYALPL	882
ESPLTWEESAL YWQPYALPL	883
ETPLTWEEESNAY YWQPYALPL	884
EATFTWAESNAY YWQPYALPL	885
EALFTWKESTAY YWQPYALPL	886
STP-TWEEESNAY YWQPYALPL	887
ETPFTWEESNAY YWQPYALPL	888
KAPFTWEESQAY YWQPYALPL	889

STSFTWEESNAY YWQPYALPL	890
DSTFTWEESNAY YWQPYALPL	891
YIPFTWEESNAY YWQPYALPL	892
QTAFTWEESNAY YWQPYALPL	893
ETLFTWEESNAT YWQPYALPL	894
VSSFTWEESNAY YWQPYALPL	895
QPYALPL	896
Py-1-NapPYQJYALPL	897
TANVSSFEWTPG YWQPYALPL	898
FEWTPGYWQPYALPL	899
FEWTPGYWQJYALPL	900
FEWTPGYWQJYALPL	901
ETPFTWEESNAYYWQPYALPL	902
FTWEESNAYYWQJYALPL	903
ADVL YWQPYA PVTWV	904
GDVAE YWQPYA LPLTSL	905
SWTDYG YWQPYA LPISGL	906
FEWTPGYWQPYALPL	911
FEWTPGYWQJYALPL	912
FEWTPGWYQPYALPL	913
FEWTPGWYQJYALPL	914
FEWTPGYWQPYALPL	915
FEWTPGYWQJYALPL	916
TANVSSFEWTPGYWQPYALPL	918
SWTDYGYWQPYALPISGL	919
ETPFTWEESNAYYWQPYALPL	920
ENTYSPNWADSMYWQPYALPL	921
SVGEDHNFWTSEYWQPYALPL	922
DGYDRWRQSGERYWQPYALPL	923
FEWTPGYWQPYALPL	924
FEWTPGYWQPY	925
FEWTPGYWQJY	926
EWTPGYWQPY	927
FEWTPGWYQJY	928
AEWTPGYWQJY	929
FAWTPGYWQJY	930
FEATPGYWQJY	931
FEWAPGYWQJY	932
FEWTAGYWQJY	933
FEWTPAYWQJY	934
FEWTPGAWQJY	935
FEWTPGYAQJY	936
FEWTPGYWQJA	937
FEWTGGYWQJY	938
FEWTPGYWQJY	939
FEWTJGYWQJY	940
FEWTPecGYWQJY	941
FEWTPAibYWQJY	942
FEWTPSarWYQJY	943
FEWTSarGYWQJY	944

FEWTPNYWQJY	945
FEWTPVYWQJY	946
FEWTPPYWQJY	947
AcFEWTPGWYQJY	948
AcFEWTPGYWQJY	949
INap-EWTPGYYQJY	950
YEWTPGYYQJY	951
FEWVPGYYQJY	952
FEWTPGYYQJY	953
FEWTPsYYQJY	954
FEWTPnYYQJY	955
SHLY-Nap-QPYSVQM	956
TLVY-Nap-QPYSLQT	957
RGDY-Nap-QPYSVQS	958
NMVY-Nap-QPYSIQT	959
VYWQPYSVQ	960
VY-Nap-QPYSVQ	961
TFVYWQJYALPL	962
FEWTPGYYQJ-Bpa	963
XaaFEWTPGYYQJ-Bpa	964
FEWTPGY-Bpa-QJY	965
AcFEWTPGY-Bpa-QJY	966
FEWTPG-Bpa-YQJY	967
AcFEWTPG-Bpa-YQJY	968
AcFE-Bpa-TPGYYQJY	969
AcFE-Bpa-TPGYYQJY	970
Bpa-EWTPGYYQJY	971
AcBpa-EWTPGYYQJY	972
VYWQPYSVQ	973
RLVYWQPYSVQR	974
RLVY-Nap-QPYSVQR	975
RLDYWQPYSVQR	976
RLVWFQPYSVQR	977
RLVYWQPYSIQR	978
DNSSWYDSFLL	980
DNTAWYESFLA	981
DNTAWYENFLL	982
PARE DNTAWYDSFLI WC	983
TSEY DNTTWYEFKFLA SQ	984
SQIP DNTAWYQSFLH HG	985
SPFI DNTAWYENFLL TY	986
EQIY DNTAWYDHFL SY	987
TPFI DNTAWYENFLL TY	988
TYTY DNTAWYERFLM SY	989
TMTQ DNTAWYENFLL SY	990
TI DNTAWYANLVQ TYPQ	991
TI DNTAWYERFLA QYPD	992
HI DNTAWYENFLL TYTP	993
SQ DNTAWYENFLL SYKA	994
QI DNTAWYERFLL QYNA	995

NQ DNTAWYESFLL QYNT	996
TI DNTAWYENFLL NHNL	997
HY DNTAWYERFLQ QGWH	998
ETPFTWEESNAYYWQPYALPL	999
YIPFTWEESNAYYWQPYALPL	1000
DGYDRWRQSGERYWQPYALPL	1001
pY-INap-pY-QJYALPL	1002
TANVSSFEWTPGYWQPYALPL	1003
FEWTPGYWQJYALPL	1004
FEWTPGYWQPYALPLSD	1005
FEWTPGYYQJYALPL	1006
FEWTPGYWQJY	1007
AcFEWTPGYWQJY	1008
AcFEWTPGWYQJY	1009
AcFEWTPGYYQJY	1010
AcFEWTPaYWQJY	1011
AcFEWTPaWYQJY	1012
AcFEWTPaYYQJY	1013
FEWTPGYYQJYALPL	1014
FEWTPGYWQJYALPL	1015
FEWTPGWYQJYALPL	1016
TANVSSFEWTPGYWQPYALPL	1017
AcFEWTPGYWQJY	1018
AcFEWTPGWYQJY	1019
AcFEWTPGYYQJY	1020
AcFEWTPAYWQJY	1021
AcFEWTPAWYQJY	1022
AcFEWTPAYYQJY	1023

Table 5—EPO-mimetic peptide sequences

Sequence/structure	SEQ ID NO:
YXCXXGPXTWXCXP	83
YXCXXGPXTWXCXP-YXCXXGPXTWXCXP	84
YXCXXGPXTWXCXP- Λ -YXCXXGPXTWXCXP	85
YXCXXGPXTWXCXP- Λ - <div style="display: inline-block; vertical-align: middle;"> $\begin{array}{c} \text{K} \\ \diagup \quad \diagdown \\ (\epsilon\text{-amine}) \quad \beta\text{A} \\ (\alpha\text{-amine}) \end{array}$ </div>	86
GGTYSCHFGPLTWVCKPQGG	87
GGDYHCRMGPLTWVCKPLGG	88
GGVYACRMGPITWVCSPLGG	89
VGNYMCHFGPITWVCRPGGG	90
GGLYLCRFGPVTWDCGYKGG	91
GGTYSCHFGPLTWVCKPQGG- GGTYSCHFGPLTWVCKPQGG	92
GGTYSCHFGPLTWVCKPQGG - Λ - GGTYSCHFGPLTWVCKPQGG	93
GGTYSCHFGPLTWVCKPQGGSSK	94
GGTYSCHFGPLTWVCKPQGGSSK- GGTYSCHFGPLTWVCKPQGGSSK	95
GGTYSCHFGPLTWVCKPQGGSSK- Λ - GGTYSCHFGPLTWVCKPQGGSSK	96
GGTYSCHFGPLTWVCKPQGGSS <div style="display: inline-block; vertical-align: middle;"> $\begin{array}{c} \text{K} \\ \diagup \quad \diagdown \\ (\epsilon\text{-amine}) \quad \beta\text{A} \\ (\alpha\text{-amine}) \end{array}$ </div>	97
GGTYSCHFGPLTWVCKPQGGSS GGTYSCHFGPLTWVCKPQGGSS GGTYSCHFGPLTWVCKPQGGSS	97
GGTYSCHFGPLTWVCKPQGGSSK(- Λ -biotin)	98
CX ₄ X ₃ GPX ₈ TWX ₇ C	421
GGTYSCHGPLTWVCKPQGG	422
VGNYMAHMGPIWVCRPGG	423
GGPHHVYACRMGPLTWIC	424
GGTYSCHFGPLTWVCKPQ	425
GGLYACHMGPMTWVCQPLRG	426
TIAQYICYMGPETWECRPSKA	427
YSCHFGPLTWVCK	428
YCHFGPLTWVC	429
X ₃ X ₄ X ₅ GPX ₈ TWX ₇ X ₈	124
YX ₂ X ₃ X ₄ GPX ₈ TWX ₇ X ₈	461

X ₁ YX ₂ X ₃ X ₄ X ₅ GPX ₆ TWX ₇ X ₈ X ₉ X ₁₀ X ₁₁	419
X ₁ YX ₂ CX ₃ X ₄ X ₅ GPX ₆ TWX ₇ CX ₈ X ₉ X ₁₀ X ₁₁	420
GGLYLCRFGPVTWDCGYKGG	1024
GGTYSCHFGPLTWCKPQGG	1025
GGDYHCRMGPLTWCKPLGG	1026
VGNYMCHFGPITWVCRPGGG	1029
GGVYACRMGPITWVCSPLGG	1030
VGNYPMAHMGPIWVCRPGG	1035
GGTYSCHFGPLTWCKPQ	1036
GGLYACHMGPMWVWCQPLRG	1037
TIAQYICYMGPETWECRPSKA	1038
YSCHFGPLTWVCK	1039
YCHFGPLTWVC	1040
SCHFGPLTWVCK	1041
(AX ₂)X ₃ X ₄ X ₅ GPX ₆ TWX ₇ X ₈	1042

Table 6—TPO-mimetic peptide sequences

Sequence/structure	SEQ ID NO:
IEGPTLRQWLAARA	13
IEGPTLRQWLAAKA	24
IEGPTLREWLAARA	25
IEGPTLRQWLAARA- Λ -IEGPTLRQWLAARA	26
IEGPTLRQWLAAKA- Λ -IEGPTLRQWLAAKA	27
IEGPTLRQCLAARA- Λ -IEGPTLRQCLAARA	28
IEGPTLRQWLAARA- Λ -K(BrAc)- Λ -IEGPTLRQWLAARA	29
IEGPTLRQWLAARA- Λ -K(PEG)- Λ -IEGPTLRQWLAARA	30
IEGPTLRQCLAARA- Λ -IEGPTLRQWLAARA	31
IEGPTLRQCLAARA- Λ -IEGPTLRQWLAARA	31
IEGPTLRQWLAARA- Λ -IEGPTLRQCLAARA	32
IEGPTLRQWLAARA- Λ -IEGPTLRQCLAARA	32
VRDQIXXXL	33
TLREWL	34
GRVRDQVAGW	35
GRVKDQIAQL	36
GVRDQVSWAL	37
ESVREQVMKY	38
SVRSQISASL	39
GVRETVYRHM	40
GVREVIVMHML	41
GRVRDQIWAAL	42
AGVRDQILIWL	43
GRVRDQIMLSL	44
GRVRDQI(X) ₃ L	45
CTLRQWLQGC	46
CTLQEFLEGC	47
CTRTEWLHGC	48
CTLREWLHGGFC	49
CTLREWVFAGLC	50
CTLRQWLILLGMC	51
CTLAEFLLASGVEQC	52
CSLQEFLLSHGGYVC	53
CTLREFLDPTTAVC	54
CTLKEWLVSHEVWC	55
CTLREWL(X) ₂₋₆ C	56-60
REGPTLRQWM	61
EGPTLRQWLA	62
ERGPFWAKAC	63
REGPRCVMWM	64
CGTEGPTLSTWLDC	65

CEQDGPTLLEWLKC	66
CELVGPSLMSWLTC	67
CLTGPFVTQWLYEC	68
CRAGPTLLEWLTLC	69
CADGPTLREWISFC	70
C(X) _{1,2} EGPTLREWL(X) _{1,2} C	71-74
GGCTLREWLHGGFCGG	75
GGCADGPTLREWISFCGG	76
GNADGPTLRQWLEGRRPKN	77
LAIEGPTLRQWLHGNGRDT	78
HGRVGPTLREWKTQVATKK	79
TIKGPTLRQWLKSREHTS	80
ISDGPTLKEWLSVTRGAS	81
SIEGPTLREWLTSRTPHS	82

Table 7—G-CSF-mimetic peptide sequences

Sequence/structure	SEQ ID NO:
EEDCK	99
EEDCK	99
 EEDCK	99
EED σ K	100
EED σ K	100
 EED σ K	100
pGluED σ K	101
pGluED σ K	101
 pGluED σ K	101
PicSD σ K	102
PicSD σ K	102
 PicSD σ K	102
EEDCK- Λ -EEDCK	103
EEDXK- Λ -EEDXK	104

Table 8—TNF-antagonist peptide sequences

Sequence/structure	SEQ ID NO:
YCFTASENHCY	106
YCFTNSENHCY	107
YCFTRSENHCY	108
FCASENHCY	109
YCASENHCY	110
FCNSENHCY	111
FCNSENRCY	112
FCNSVENRCY	113
YCSQSVSND CF	114
FCVSNDRCY	115
YCRKELGQVCY	116
YCKEPGQCY	117
YCRKEMGCY	118
FCRKEMGCY	119
YCWSQNLCY	120
YCELSQYLCY	121
YCWSQNYCY	122
YCWSQYLCY	123
DFLPHYKNTSLGHRP	1085
$ \begin{array}{c} \text{AA}_1\text{-AB}_1 \\ \quad \quad \quad \backslash \\ \quad \quad \quad \text{AC} \\ \quad \quad \quad / \\ \text{AA}_2\text{-AB}_2 \end{array} $	NR

Table 9—Integrin-binding peptide sequences

Sequence/structure	SEQ ID NO:
RX ₁ ETX ₂ WX ₃	441
RX ₁ ETX ₂ WX ₃	442
RGDGX	443
CRGDGXC	444
CX ₁ X ₂ RLDX ₃ X ₄ C	445
CARRLDAPC	446
CPSRLDSPC	447
X ₁ X ₂ X ₃ RGDX ₄ X ₅ X ₆	448
CX ₂ CRGDCX ₅ C	449
CDCRGDCFC	450
CDCRGDCLC	451
CLCRGDCIC	452
X ₁ X ₂ DDX ₄ X ₅ X ₇ X ₈	453
X ₁ X ₂ X ₃ DDX ₄ X ₅ X ₆ X ₇ X ₈	454
CWDDGWLC	455
CWDDLWWLC	456
CWDDGLMC	457
CWDDGWMC	458
CSWDDGWLC	459
CPDDLWWLC	460
NGR	NR
GSL	NR
RGD	NR
CGRECPRLCQSSC	1071
CNGRCVSGCAGRC	1072
CLSGSLSC	1073
RGD	NR
NGR	NR
GSL	NR
NGRAHA	1074
CNGRC	1075
CDCRGDCFC	1076
CGSLVRC	1077
DLXXL	1043
RTDLDSLRTYTL	1044
RTDLDSLRTY	1053
RTDLDSLRT	1054
RTDLDSLRL	1078
GDLDLLKLRLTL	1079
GDLSLRQLLSR	1080
RDDLHMLRLQLW	1081
SSDLHALKKRYG	1082
RGDLKQLSELTW	1083
RGDLAALSAPPV	1084

Table 10—Selectin antagonist peptide sequences

Sequence/structure	SEQ ID NO:
DITWDQLWDLMK	147
DITWDELWKIMN	148
DYTWFEFLWDMMQ	149
QITWAQLWNMMK	150
DMTWHDLWTLMS	151
DYSWHDLWEMMS	152
EITWDQLWEVMN	153
HVSWEQLWDIMN	154
HITWDQLWRIMT	155
RNMSWLELWEHMK	156
AEWTWDQLWHVMNPAESQ	157
HRAEWLALWEQMSP	158
KKEDWLALWRIMSV	159
ITWDQLWDLMK	160
DITWDQLWDLMK	161
DITWDQLWDLMK	162
DITWDQLWDLMK	163
CQNRYTDLVAIQNKNE	462
AENWADNEPNKRNED	463
RKNNKTWTWVGTKKALTNE	464
KKALTNEAENWAD	465
CQXRYTDLVAIQNKXE	466
RKXNXXWTWVGTXKXLTEE	467
AENWADGEPNNKXNXED	468
CXXXYTXLVAIQNKXE	469
RKXXXXWXWVGTXKXLTXE	470
AXNWXXXEPNNXXXED	471
XKXKTXEAXNWXX	472

Table 11—Antipathogenic peptide sequences

Sequence/structure	SEQ ID NO:
GFFALIPKIISSPLFKTLLSAVGSALSSSSGGQQ	503
GFFALIPKIISSPLFKTLLSAVGSALSSSSGGQE	504
GFFALIPKIISSPLFKTLLSAV	505
GFFALIPKIISSPLFKTLLSAV	506
KGFFALIPKIISSPLFKTLLSAV	507
KKGFFALIPKIISSPLFKTLLSAV	508
KKGFFALIPKIISSPLFKTLLSAV	509
GFFALIPKIISS	510
GIGAVLKVLTTGLPALISWIKRKRQQ	511
GIGAVLKVLTTGLPALISWIKRKRQQ	512
GIGAVLKVLTTGLPALISWIKRKRQQ	513
GIGAVLKVLTTGLPALISWIKR	514
AVLKVLTTGLPALISWIKR	515
KLLLLLKLLLLK	516
KLLLKLLLKLLK	517
KLLLKLLKLLK	518
KKLLKLLKLLK	519
KLLLKLLLKLLK	520
KLLLKLLKLLK	521
KLLLLK	522
KLLLKLLK	523
KLLLKLLKLLK	524
KLLLKLLKLLK	525
KLLLKLLKLLK	526
KAAAKAAAKAAK	527
KVVVKVVVKVVK	528
KVVVKVKVKVVK	529
KVVVKVKVKVK	530
KVVVKVKVKVVK	531
KLILKL	532
KVLHLL	533
LKLRL	534
KPLHLL	535
KLILKLVR	536
KVFHLLHL	537
HKFRILKL	538
KPFHILHL	539
KIIKIKIKIK	540
KIIKIKIKIK	541
KIIKIKIKIK	542
KIPIKIKIKIPK	543
KIPIKIKIKIVK	544
RIIRIRIRIR	545
RIIRIRIRIR	546
RIIRIRIRIR	547
RIVIRIRIRLIR	548

RIIVRIRLRIIR	549
RIGIRLRVRIIR	550
KIVIRIRIRLIR	551
RIAVKWRLRFIK	552
KIGWKLRVRIIR	553
KKIGWLIIRVRR	554
RIVIRIRIRLIRIR	555
RIIVRIRLRIIRVR	556
RIGIRLRVRIIRRV	557
KIVIRIRARLIRIRIR	558
RIIVKIRLRIKKIRL	559
KIGIKARVRIIRVKII	560
RIIVHIRLRIIHHIRL	561
HIGIKAHVRIIRVHII	562
RIYVKIHLRYIKKIRL	563
KIGHKARVHIIRYKII	564
RIYVKPHPRYIKKIRL	565
KPGHKARPHIIRYKII	566
KIVIRIRIRLIRIRIRKIV	567
RIIVKIRLRIKKIRLIKK	568
KIGWKLRVRIIRVKIGRLR	569
KIVIRIRIRLIRIRIRKIVKVKRIIR	570
RFAVKIRLRIKKIRLIKKIRKRVIK	571
KAGWKLRVRIIRVKIGRLRKIGWKRVRIK	572
RIYVKPHPRYIKKIRL	573
KPGHKARPHIIRYKII	574
KIVIRIRIRLIRIRIRKIV	575
RIIVKIRLRIKKIRLIKK	576
RIYVSKISYIKKIRL	577
KIVIFTRIRLTSIRIRSIV	578
KPIHKARPTIIRYKMI	579
cyclicCKGFFALIPKIISSPLFKTLLSAVC	580
CKKGFFALIPKIISSPLFKTLLSAVC	581
CKKKGFFALIPKIISSPLFKTLLSAVC	582
CyclicCRIVIRIRIRLIRIRC	583
CyclicCKPGHKARPHIIRYKIIC	584
CyclicCRFAVKIRLRIKKIRLIKKIRKRVIKC	585
KLLKLLKLLKLLKC	586
KLLKLLKLLKLLK	587
KLLKLLKLLKLLKC	588
KLLKLLKLLKLLK	589

Table 12—VIP-mimetic peptide sequences

Sequence/structure	SEQ ID NO:
HSDAVFYDNYTR LRKQMAVKKYLN SILN	590
Nle HSDAVFYDNYTR LRKQMAVKKYLN SILN	591
X ₁ X ₁ ' X ₁ " X ₂	592
X ₂ S X ₄ LN	593
NH CH CO KKYX5 NH CH CO X6 <div style="display: flex; justify-content: space-around; width: 100%;"> <div style="text-align: center;"> $\begin{array}{c} \\ (\text{CH}_2)_m \end{array}$ </div> <div style="text-align: center;">Z</div> <div style="text-align: center;"> $\begin{array}{c} \\ (\text{CH}_2)_n \end{array}$ </div> </div>	594
KKYL	595
NSILN	596
KKYL	597
KKYA	598
AVKKYL	599
NSILN	600
KKYV	601
SILauN	602
KKYLNle	603
NSYLN	604
NSIYN	605
KKYLPPNSILN	606
LauKKYL	607
CapKKYL	608
KYL	NR
KKYNle	609
VKKYL	610
LNSILN	611
YLNSILN	612
KKYLN	613
KKYLN S	614
KKYLN SI	615
KKYLN SIL	616
KKYL	617
KKYDA	618
AVKKYL	619
NSILN	620
KKYV	621
SILauN	622
NSYLN	623
NSIYN	624
KKYLNle	625
KKYLPPNSILN	626
KKYL	627
KKYDA	628
AVKKYL	629
NSILN	630
KKYV	631
SILauN	632

LauKKYL	633
CapKKYL	634
KYL	NR
KYL	NR
KKYNI ₆	635
VKKYL	636
LNSILN	637
YLNSILN	638
KKYLN ₆	639
KKYLN	640
KKYLN _S	641
KKYLN _{SI}	642
KKYLN _{SIL}	643
KKKYLD	644
cyclicCKKYLC	645
CKKYLK S-CH ₂ -CO	646
KKYA	647
WWTDTGLW	648
WWTDDGLW	649
WWDTRGLWWTI	650
FWGNDGIWLESG	651
DWDQFGLWRGAA	652
RWDDNGLWVVVL	653
SGMWSHYGIWMG	654
GGRWDQAGLWVA	655
KLWSEQGIWMGE	656
CWSMHGLWLC	657
GCWDNTGIWVPC	658
DWDTRGLWVY	659
SLWDENGAWI	660
KWDDRGLWMH	661
QAWNERGLWT	662
QWDTRGLWVA	663
WNVHGIWQE	664
SWDTRGLWVE	665
DWDTRGLWVA	666
SWGRDGLWIE	667
EWTDNGLWAL	668
SWDEKGLWSA	669
SWDSSGLWMD	670

Table 13—Mdm/hdm antagonist peptide sequences

Sequence/structure	SEQ ID NO:
TFSDLW	130
QETFSDLWKLLP	131
QPTFSDLWKLLP	132
QETFSDYWKLLP	133
QPTFSDYWKLLP	134
MPRFMDYWEGLN	135
VQNFIDYWTQQF	136
TGPAFTHYWATF	137
IDRAPTRFRDHWFALV	138
PRPALVFADYWETLY	139
PAFSRFWSDSL SAGAH	140
PAFSRFWSKLSAGAH	141
PXFXDYWXXL	142
QETFSDLWKLLP	143
QPTFSDLWKLLP	144
QETFSDYWKLLP	145
QPTFSDYWKLLP	146

Table 14—Calmodulin antagonist peptide sequences

Sequence/structure	SEQ ID NO:
SCVKWKGKEFCGS	164
SCWKYWGKECGS	165
SCYEWGKLRWCGS	166
SCLRWGKWSNCGS	167
SCWRWGKYQICGS	168
SCVSWGALKLCGS	169
SCIRWGQNTFCGS	170
SCWQWGNLKICGS	171
SCVRWGQLSICGS	172
LKKFNARRKLKGAILTTMLAK	173
RRWKKNFIAVSAANRFKK	174
RKWQKTGHAVRAIGRLSS	175
INLKALAALAKKIL	176
KIWSILAPLGTTLVKLVA	177
LKKLLKLLKKLLKL	178
LKWKKLLKLLKKLLKKLL	179
AEWPSLTEIKTL SHFSV	180
AEWPSPTRVISTTYFGS	181
AELAHWPPVKTVLRSFT	182
AEGSWLQLLNLMKQMNN	183
AEWPSLTEIK	184

**Table 15—Mast cell antagonists/Mast cell protease inhibitor
peptide sequences**

Sequence/structure	SEQ ID NO:
SGSGVLKRPLPILPVTR	272
RWLSSRPLPPLPLPPRT	273
GSGSYDTLALPSLPLHPMSS	274
GSGSYDTRALPSLPLHPMSS	275
GSGSSGVTMYPKLPPHWSMA	276
GSGSSGVRMYPKLPPHWSMA	277
GSGSSSMRMVPTIPGSAKHG	278
RNR	NR
QT	NR
RQK	NR
NRQ	NR
RQK	NR
RNRQKT	436
RNRQ	437
RNRQK	438
NRQKT	439
RQKT	440

Table 16—SH3 antagonist peptide sequences

Sequence/structure	SEQ ID NO:
RPLPPLP	282
RELPPPLP	283
SPLPPLP	284
GPLPPLP	285
RPLPIPP	286
RPLPIPP	287
RRLPPTP	288
RQLPPTP	289
RPLPSRP	290
RPLPTRP	291
SRLPPLP	292
RALPSPP	293
RRLPRTP	294
RPVPPIT	295
ILAPPVP	296
RPLPMLP	297
RPLPILP	298
RPLPSLP	299
RPLPSLP	300
RPLPMIP	301
RPLPLIP	302
RPLPPTP	303
RSLPPLP	304
RPQPPPP	305
RQLPIPP	306
XXXRPLPPLPXP	307
XXXRPLPPIPXX	308
XXXRPLPPLPXX	309
RXXRPLPPLPXP	310
RXXRPLPPLPPP	311
PPPYPPPIIPXX	312
PPPYPPPPVPXX	313
LXXRPLPX Ψ P	314
Ψ XXRPLPXL	315
PPX Θ XPPP Ψ P	316
+PP Ψ PXKPXWL	317
RPX Ψ P Ψ R+SXP	318
PPVPPRPXXTL	319
Ψ P Ψ LP Ψ K	320
+ Θ DXPLPXL	321

Table 17—Somatostatin or cortistatin mimetic peptide sequences

Sequence/structure	SEQ ID NO:
X ¹ -X ² -Asn-Phe-Phe-Trp-Lys-Thr-Phe-X ³ -Ser-X ⁴	473
Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys	474
Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys	475
Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys	476
Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	477
Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	478
Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	479
Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	480
Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys	481
Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys	482
Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	483
Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	484
Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys	485
Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	486
Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	487
Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	488
Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	489
Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	490
Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	491
Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	492
Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	493
Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys Lys	494
Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	495
Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	496
Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys	497

Table 18—UKR antagonist peptide sequences

Sequence/structure	SEQ ID NO:
AEPMPHSLNFSQYLWYT	196
AEHTYSSLWDTYSPLAF	197
AELDLWMRHYPLSFSNR	198
AESSLWTRYAWPSMPSY	199
AEWHPGLSFGSYLWSKT	200
AEPALLNWSFFFNPGLH	201
AEWSFYNLHLPEPQTIF	202
AEPLDLWSLYSLPPLAM	203
AEPTLWQLYQFPLRLSG	204
AEISFSELMWLRSTPAF	205
AELSEADLWTTWFGMGS	206
AESSLWRIFSPSALMMS	207
AESLPTLTSILWGKESV	208
AETLFMDLWHDKHILLT	209
AEILNFPLWHEPLWSTE	210
AESQTGTLNTLFWNTRLR	211
AEPVYQYELDSYLRSY	430
AELDLSTFYDIQYLLRT	431
AEFFKLGPNGYVYLHSA	432
FKLXXGYVYL	433
AESTYHHLSLGYMYTLN	434
YHXLXXGYMYT	435

**Table 19—Macrophage and/or
T-cell inhibiting peptide sequences**

Sequence/structure	SEQ ID NO:
Xaa-Yaa-Arg	NR
Arg-Yaa-Xaa	NR
Xaa-Arg-Yaa	NR
Yaa-Arg-Xaa	NR
Ala-Arg	NR
Arg-Arg	NR
Asn-Arg	NR
Asp-Arg	NR
Cys-Arg	NR
Gln-Arg	NR
Glu-Arg	NR
Gly-Arg	NR
His-arg	NR
Ile-Arg	NR
Leu-Arg	NR
Lys-Arg	NR
Met-Arg	NR
Phe-Arg	NR
Ser-Arg	NR
Thr-Arg	NR
Trp-Arg	NR
Tyr-Arg	NR
Val-Arg	NR
Ala-Glu-Arg	NR
Arg-Glu-Arg	NR
Asn-Glu-Arg	NR
Asp-Glu-Arg	NR
Cys-Glu-Arg	NR
Gln-Glu-Arg	NR
Glu-Glu-Arg	NR
Gly-Glu-Arg	NR
His-Glu-Arg	NR
Ile-Glu-Arg	NR
Leu-Glu-Arg	NR
Lys-Glu-Arg	NR
Met-Glu-Arg	NR
Phe-Glu-Arg	NR
Pro-Glu-Arg	NR
Ser-Glu-Arg	NR
Thr-Glu-Arg	NR
Trp-Glu-Arg	NR
Tyr-Glu-Arg	NR
Val-Glu-Arg	NR

Arg-Ala	NR
Arg-Asp	NR
Arg-Cys	NR
Arg-Gln	NR
Arg-Glu	NR
Arg-Gly	NR
Arg-His	NR
Arg-Ile	NR
Arg-Leu	NR
Arg-Lys	NR
Arg-Met	NR
Arg-Phe	NR
Arg-Pro	NR
Arg-Ser	NR
Arg-Thr	NR
Arg-Trp	NR
Arg-Tyr	NR
Arg-Val	NR
Arg-Glu-Ala	NR
Arg-Glu-Asn	NR
Arg-Glu-Asp	NR
Arg-Glu-Cys	NR
Arg-Glu-Gln	NR
Arg-Glu-Glu	NR
Arg-Glu-Gly	NR
Arg-Glu-His	NR
Arg-Glu-Ile	NR
Arg-Glu-Leu	NR
Arg-Glu-Lys	NR
Arg-Glu-Met	NR
Arg-Glu-Phe	NR
Arg-Glu-Pro	NR
Arg-Glu-Ser	NR
Arg-Glu-Thr	NR
Arg-Glu-Trp	NR
Arg-Glu-Tyr	NR
Arg-Glu-Val	NR
Ala-Arg-Glu	NR
Arg-Arg-Glu	NR
Asn-Arg-Glu	NR
Asp-Arg-Glu	NR
Cys-Arg-Glu	NR
Gln-Arg-Glu	NR
Glu-Arg-Glu	NR
Gly-Arg-Glu	NR
His-Arg-Glu	NR
Ile-Arg-Glu	NR
Leu-Arg-Glu	NR
Lys-Arg-Glu	NR
Met-Arg-Glu	NR

Phe-Arg-Glu	NR
Pro-Arg-Glu	NR
Ser-Arg-Glu	NR
Thr-Arg-Glu	NR
Trp-Arg-Glu	NR
Tyr-Arg-Glu	NR
Val-Arg-Glu	NR
Glu-Arg-Ala,	NR
Glu-Arg-Arg	NR
Glu-Arg-Asn	NR
Glu-Arg-Asp	NR
Glu-Arg-Cys	NR
Glu-Arg-Gln	NR
Glu-Arg-Gly	NR
Glu-Arg-His	NR
Glu-Arg-Ile	NR
Glu-Arg-Leu	NR
Glu-Arg-Lys	NR
Glu-Arg-Met	NR
Glu-Arg-Phe	NR
Glu-Arg-Pro	NR
Glu-Arg-Ser	NR
Glu-Arg-Thr	NR
Glu-Arg-Trp	NR
Glu-Arg-Tyr	NR
Glu-Arg-Val	NR

Table 20—Additional Exemplary Pharmacologically Active Peptides

Sequence/structure	SEQ ID NO:	Activity
VEPNCDIHVMWEWECFERL	1027	VEGF-antagonist
GERWCFDGPLTWVCGEES	1084	VEGF-antagonist
RGWVEICVADDNGMCVTEAQ	1085	VEGF-antagonist
GWDECDVARMWEWECFAGV	1086	VEGF- antagonist
GERWCFDGPRAWVCGWEI	501	VEGF- antagonist
EELWCFDGPRAWVCGYVK	502	VEGF- antagonist
RGWVEICAADDYGRCLTEAQ	1031	VEGF- antagonist
RGWVEICESDVWGRCL	1087	VEGF- antagonist
RGWVEICESDVWGRCL	1088	VEGF- antagonist
GGNECDIARMWEWECFERL	1089	VEGF- antagonist
RGWVEICAADDYGRCL	1090	VEGF-antagonist
CTTHWGFTLC	1028	MMP inhibitor
CLRSGXGC	1091	MMP inhibitor
CXXHWGFXXC	1092	MMP inhibitor
CXPXC	1093	MMP inhibitor
CRRHWGFEEFC	1094	MMP inhibitor
STTHWGFTLS	1095	MMP inhibitor
CSLHWGFWWC	1096	CTLA4-mimetic
GFVCSGIFAVGVGRC	125	CTLA4-mimetic
APGVRLGCAVLGRYC	126	CTLA4-mimetic
LLGRMK	105	Antiviral (HBV)
ICVVQDWGHHRCTAGHMANLTSHASAI	127	C3b antagonist
ICVVQDWGHHRCT	128	C3b antagonist
CVVQDWGHHAC	129	C3b antagonist
STGGFDDVYDWARGVSSALTTTLVATR	185	Vinculin-binding
STGGFDDVYDWARRVSSALTTTLVATR	186	Vinculin-binding
SRGVNFSEWLYDMSAAMKEASNVFPSRRSR	187	Vinculin-binding
SSQNWDMEAGVEDLTAAMLGLLSTIHSSSR	188	Vinculin-binding
SSPSLYTQFLVNYESAATRIQDLLIASRPSR	189	Vinculin-binding
SSTGWVDLLGALQRAADATRTSIPPSLQNSR	190	Vinculin-binding
DVYTKKELIECARRVSEK	191	Vinculin-binding
EKGSYYPGSGIAQFHIDYNNVS	192	C4BP-binding
SGIAQFHIDYNNVSSAEGWHVN	193	C4BP-binding
LVTVEKGSYYPGSGIAQFHIDYNNVSSAEGWHVN	194	C4BP-binding
SGIAQFHIDYNNVS	195	C4BP-binding
LLGRMK	279	anti-HBV
ALLGRMKG	280	anti-HBV
LDPAFR	281	anti-HBV
CXXRGDC	322	Inhibition of platelet aggregation
RPLPPLP	323	Src antagonist
PPVPPR	324	Src antagonist
XFXDXWXXLXX	325	Anti-cancer (particularly for

		sarcomas)
KACRRLFGPVDSEQLSRDCD	326	p16-mimetic
RERWNFDVFTETPLEGDFAW	327	p16-mimetic
KRRQTSMTDFYHSKRRLIFS	328	p16-mimetic
TSMTDFYHSKRRLIFSKRKP	329	p16-mimetic
RRLIF	330	p16-mimetic
KRRQTSATDFYHSKRRLIFSRQIKIWFQNRRMKWKK	331	p16-mimetic
KRRLIFSKRQIKIWFQNRRMKWKK	332	p16-mimetic
Asn Gln Gly Arg His Phe Cys Gly Gly Ala Leu Ile His Ala Arg Phe Val Met Thr Ala Ala Ser Cys Phe Gln	498	CAP37 mimetic/LPS binding
Arg His Phe Cys Gly Gly Ala Leu Ile His Ala Arg Phe Val Met Thr Ala Ala Ser Cys	499	CAP37 mimetic/LPS binding
Gly Thr Arg Cys Gln Val Ala Gly Trp Gly Ser Gln Arg Ser Gly Gly Arg Leu Ser Arg Phe Pro Arg Phe Val Asn Val	500	CAP37 mimetic/LPS binding
WHWRHRIPLQLAAGR	1097	carbohydrate (GD1 alpha) mimetic
LKTPRV	1098	β 2GPI Ab binding
NLTKTPRV	1099	β 2GPI Ab binding
NLTKTPRVGGC	1100	β 2GPI Ab binding
KDKATF	1101	β 2GPI Ab binding
KDKATFGCHD	1102	β 2GPI Ab binding
KDKATFGCHDGC	1103	β 2GPI Ab binding
TLRVYK	1104	β 2GPI Ab binding
ATLRVYKGG	1105	β 2GPI Ab binding
CATLRVYKGG	1106	β 2GPI Ab binding
INLKALAALAKKIL	1107	Membrane- transporting
GWT	NR	Membrane- transporting
GWTLNSAGYLLG	1108	Membrane- transporting
GWTLNSAGYLLGKINLKALAALAKKIL	1109	Membrane- transporting

The present invention is also particularly useful with peptides having activity in treatment of:

- cancer, wherein the peptide is a VEGF-mimetic or a VEGF receptor antagonist, a HER2 agonist or antagonist, a CD20 antagonist and the like;
- asthma, wherein the protein of interest is a CKR3 antagonist, an IL-5 receptor antagonist, and the like;
- thrombosis, wherein the protein of interest is a GPIIb antagonist, a GPIIIa antagonist, and the like;

- autoimmune diseases and other conditions involving immune modulation, wherein the protein of interest is an IL-2 receptor antagonist, a CD40 agonist or antagonist, a CD40L agonist or antagonist, a thymopoietin mimetic and the like.

5 Vehicles. This invention requires the presence of at least one vehicle (F¹, F²) attached to a peptide through the N-terminus, C-terminus or a sidechain of one of the amino acid residues. Multiple vehicles may also be used; e.g., Fc's at each terminus or an Fc at a terminus and a PEG group at the other terminus or a sidechain.

10 An Fc domain is the preferred vehicle. The Fc domain may be fused to the N or C termini of the peptides or at both the N and C termini. For the TPO-mimetic peptides, molecules having the Fc domain fused to the N terminus of the peptide portion of the molecule are more bioactive than other such fusions, so fusion to the N terminus is preferred.

15 As noted above, Fc variants are suitable vehicles within the scope of this invention. A native Fc may be extensively modified to form an Fc variant in accordance with this invention, provided binding to the salvage receptor is maintained; see, for example WO 97/34631 and WO 96/32478. In such Fc variants, one may remove one or more sites of a native Fc that
20 provide structural features or functional activity not required by the fusion molecules of this invention. One may remove these sites by, for example, substituting or deleting residues, inserting residues into the site, or truncating portions containing the site. The inserted or substituted residues may also be altered amino acids, such as peptidomimetics or D-
25 amino acids. Fc variants may be desirable for a number of reasons, several of which are described below. Exemplary Fc variants include molecules and sequences in which:

1. Sites involved in disulfide bond formation are removed. Such removal may avoid reaction with other cysteine-containing proteins present in

the host cell used to produce the molecules of the invention. For this purpose, the cysteine-containing segment at the N-terminus may be truncated or cysteine residues may be deleted or substituted with other amino acids (e.g., alanyl, seryl). In particular, one may truncate the N-terminal 20-amino acid segment of SEQ ID NO: 2 or delete or substitute the cysteine residues at positions 7 and 10 of SEQ ID NO: 2. Even when cysteine residues are removed, the single chain Fc domains can still form a dimeric Fc domain that is held together non-covalently.

2. A native Fc is modified to make it more compatible with a selected host cell. For example, one may remove the PA sequence near the N-terminus of a typical native Fc, which may be recognized by a digestive enzyme in E. coli such as proline iminopeptidase. One may also add an N-terminal methionine residue, especially when the molecule is expressed recombinantly in a bacterial cell such as E. coli. The Fc domain of SEQ ID NO: 2 (Figure 4) is one such Fc variant.
3. A portion of the N-terminus of a native Fc is removed to prevent N-terminal heterogeneity when expressed in a selected host cell. For this purpose, one may delete any of the first 20 amino acid residues at the N-terminus, particularly those at positions 1, 2, 3, 4 and 5.
4. One or more glycosylation sites are removed. Residues that are typically glycosylated (e.g., asparagine) may confer cytolytic response. Such residues may be deleted or substituted with unglycosylated residues (e.g., alanine).
5. Sites involved in interaction with complement, such as the C1q binding site, are removed. For example, one may delete or substitute the EKK sequence of human IgG1. Complement recruitment may not be advantageous for the molecules of this invention and so may be avoided with such an Fc variant.

6. Sites are removed that affect binding to Fc receptors other than a salvage receptor. A native Fc may have sites for interaction with certain white blood cells that are not required for the fusion molecules of the present invention and so may be removed.
- 5 7. The ADCC site is removed. ADCC sites are known in the art; see, for example, Molec. Immunol. 29 (5): 633-9 (1992) with regard to ADCC sites in IgG1. These sites, as well, are not required for the fusion molecules of the present invention and so may be removed.
- 10 8. When the native Fc is derived from a non-human antibody, the native Fc may be humanized. Typically, to humanize a native Fc, one will substitute selected residues in the non-human native Fc with residues that are normally found in human native Fc. Techniques for antibody humanization are well known in the art.

Preferred Fc variants include the following. In SEQ ID NO: 2 (Figure 4) the leucine at position 15 may be substituted with glutamate; the glutamate at position 99, with alanine; and the lysines at positions 101 and 103, with alanines. In addition, one or more tyrosine residues can be replaced by phenylalanine residues.

An alternative vehicle would be a protein, polypeptide, peptide, antibody, antibody fragment, , or small molecule (e.g., a peptidomimetic compound) capable of binding to a salvage receptor. For example, one could use as a vehicle a polypeptide as described in U.S. Pat. No. 5,739,277, issued April 14, 1998 to Presta et al. Peptides could also be selected by phage display for binding to the FcRn salvage receptor. Such salvage receptor-binding compounds are also included within the meaning of "vehicle" and are within the scope of this invention. Such vehicles should be selected for increased half-life (e.g., by avoiding sequences recognized by proteases) and decreased immunogenicity (e.g., by favoring non-immunogenic sequences, as discovered in antibody humanization).

As noted above, polymer vehicles may also be used for F¹ and F². Various means for attaching chemical moieties useful as vehicles are currently available, see, e.g., Patent Cooperation Treaty ("PCT") International Publication No. WO 96/11953, entitled "N-Terminally
5 Chemically Modified Protein Compositions and Methods," herein incorporated by reference in its entirety. This PCT publication discloses, among other things, the selective attachment of water soluble polymers to the N-terminus of proteins.

A preferred polymer vehicle is polyethylene glycol (PEG). The PEG
10 group may be of any convenient molecular weight and may be linear or branched. The average molecular weight of the PEG will preferably range from about 2 kiloDalton ("kD") to about 100 kDa, more preferably from about 5 kDa to about 50 kDa, most preferably from about 5 kDa to about 10 kDa. The PEG groups will generally be attached to the compounds of
15 the invention via acylation or reductive alkylation through a reactive group on the PEG moiety (e.g., an aldehyde, amino, thiol, or ester group) to a reactive group on the inventive compound (e.g., an aldehyde, amino, or ester group).

A useful strategy for the PEGylation of synthetic peptides consists
20 of combining, through forming a conjugate linkage in solution, a peptide and a PEG moiety, each bearing a special functionality that is mutually reactive toward the other. The peptides can be easily prepared with conventional solid phase synthesis (see, for example, Figures 5 and 6 and the accompanying text herein). The peptides are "preactivated" with an
25 appropriate functional group at a specific site. The precursors are purified and fully characterized prior to reacting with the PEG moiety. Ligation of the peptide with PEG usually takes place in aqueous phase and can be easily monitored by reverse phase analytical HPLC. The PEGylated peptides can be easily purified by preparative HPLC and characterized by

analytical HPLC, amino acid analysis and laser desorption mass spectrometry.

Polysaccharide polymers are another type of water soluble polymer which may be used for protein modification. Dextran is polysaccharide polymers comprised of individual subunits of glucose predominantly
5 linked by α 1-6 linkages. The dextran itself is available in many molecular weight ranges, and is readily available in molecular weights from about 1 kD to about 70 kD. Dextran is a suitable water soluble polymer for use in the present invention as a vehicle by itself or in combination with another
10 vehicle (e.g., Fc). See, for example, WO 96/11953 and WO 96/05309. The use of dextran conjugated to therapeutic or diagnostic immunoglobulins has been reported; see, for example, European Patent Publication No. 0 315 456, which is hereby incorporated by reference. Dextran of about 1 kD to about 20 kD is preferred when dextran is used as a vehicle in
15 accordance with the present invention.

Linkers. Any "linker" group is optional. When present, its chemical structure is not critical, since it serves primarily as a spacer. The linker is preferably made up of amino acids linked together by peptide bonds. Thus, in preferred embodiments, the linker is made up of from 1 to 20
20 amino acids linked by peptide bonds, wherein the amino acids are selected from the 20 naturally occurring amino acids. Some of these amino acids may be glycosylated, as is well understood by those in the art. In a more preferred embodiment, the 1 to 20 amino acids are selected from glycine, alanine, proline, asparagine, glutamine, and lysine. Even more preferably,
25 a linker is made up of a majority of amino acids that are sterically unhindered, such as glycine and alanine. Thus, preferred linkers are polyglycines (particularly (Gly)₄, (Gly)₅), poly(Gly-Ala), and polyalanines. Other specific examples of linkers are:

(Gly)₃Lys(Gly)₄ (SEQ ID NO: 333);

(Gly)₃AsnGlySer(Gly)₂ (SEQ ID NO: 334);

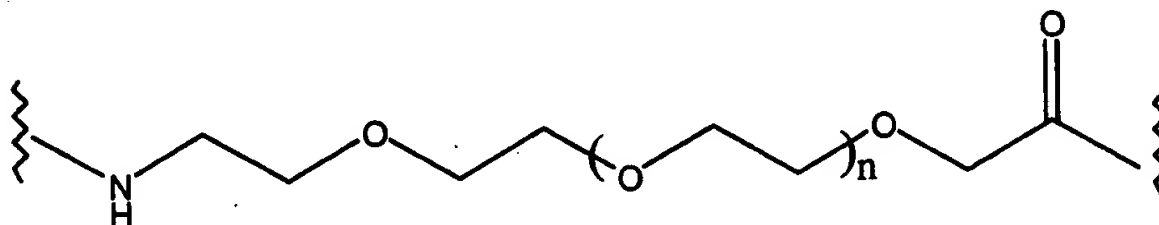
(Gly)₃Cys(Gly)₄ (SEQ ID NO: 335); and

GlyProAsnGlyGly (SEQ ID NO: 336).

To explain the above nomenclature, for example, (Gly)₃Lys(Gly)₄ means
 5 Gly-Gly-Gly-Lys-Gly-Gly-Gly-Gly. Combinations of Gly and Ala are also preferred. The linkers shown here are exemplary; linkers within the scope of this invention may be much longer and may include other residues.

Non-peptide linkers are also possible. For example, alkyl linkers such as -NH-(CH₂)_s-C(O)-, wherein s = 2-20 could be used. These alkyl
 10 linkers may further be substituted by any non-sterically hindering group such as lower alkyl (e.g., C₁-C₆) lower acyl, halogen (e.g., Cl, Br), CN, NH₂, phenyl, etc. An exemplary non-peptide linker is a PEG linker,

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15

wherein n is such that the linker has a molecular weight of 100 to 5000 kD, preferably 100 to 500 kD. The peptide linkers may be altered to form derivatives in the same manner as described above.

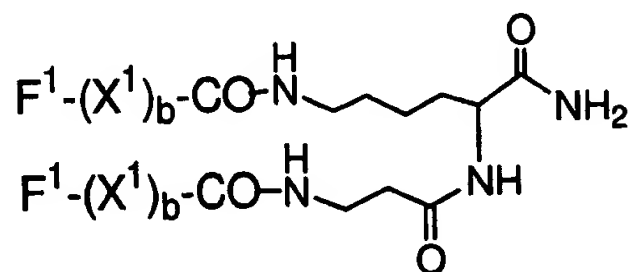
Derivatives. The inventors also contemplate derivatizing the
 20 peptide and/or vehicle portion of the compounds. Such derivatives may improve the solubility, absorption, biological half life, and the like of the compounds. The moieties may alternatively eliminate or attenuate any undesirable side-effect of the compounds and the like. Exemplary derivatives include compounds in which:

- 25 1. The compound or some portion thereof is cyclic. For example, the peptide portion may be modified to contain two or more Cys residues (e.g., in the linker), which could cyclize by disulfide bond formation.

For citations to references on preparation of cyclized derivatives, see Table 2.

2. The compound is cross-linked or is rendered capable of cross-linking between molecules. For example, the peptide portion may be modified to contain one Cys residue and thereby be able to form an intermolecular disulfide bond with a like molecule. The compound may also be cross-linked through its C-terminus, as in the molecule shown below.

VII



- 3.
4. One or more peptidyl [-C(O)NR-] linkages (bonds) is replaced by a non-peptidyl linkage. Exemplary non-peptidyl linkages are -CH₂-carbamate [-CH₂-OC(O)NR-], phosphonate, -CH₂-sulfonamide [-CH₂-S(O)₂NR-], urea [-NHC(O)NH-], -CH₂-secondary amine, and alkylated peptide [-C(O)NR⁶- wherein R⁶ is lower alkyl].
5. The N-terminus is derivatized. Typically, the N-terminus may be acylated or modified to a substituted amine. Exemplary N-terminal derivative groups include -NRR¹ (other than -NH₂), -NRC(O)R¹, -NRC(O)OR¹, -NRS(O)₂R¹, -NHC(O)NHR¹, succinimide, or benzyloxycarbonyl-NH- (CBZ-NH-), wherein R and R¹ are each independently hydrogen or lower alkyl and wherein the phenyl ring may be substituted with 1 to 3 substituents selected from the group consisting of C₁-C₄ alkyl, C₁-C₄ alkoxy, chloro, and bromo.
6. The free C-terminus is derivatized. Typically, the C-terminus is esterified or amidated. For example, one may use methods described in the art to add (NH-CH₂-CH₂-NH₂)₂ to compounds of this invention

having any of SEQ ID NOS: 504 to 508 at the C-terminus. Likewise, one may use methods described in the art to add $-NH_2$ to compounds of this invention having any of SEQ ID NOS: 924 to 955, 963 to 972, 1005 to 1013, or 1018 to 1023 at the C-terminus. Exemplary C-terminal derivative groups include, for example, $-C(O)R^2$ wherein R^2 is lower alkoxy or $-NR^3R^4$ wherein R^3 and R^4 are independently hydrogen or C_1 - C_8 alkyl (preferably C_1 - C_4 alkyl).

7. A disulfide bond is replaced with another, preferably more stable, cross-linking moiety (e.g., an alkylene). See, e.g., Bhatnagar *et al.* (1996), *J. Med. Chem.* 39: 3814-9; Alberts *et al.* (1993) *Thirteenth Am. Pep. Symp.*, 357-9.

8. One or more individual amino acid residues is modified. Various derivatizing agents are known to react specifically with selected sidechains or terminal residues, as described in detail below.

Lysinyl residues and amino terminal residues may be reacted with succinic or other carboxylic acid anhydrides, which reverse the charge of the lysinyl residues. Other suitable reagents for derivatizing alpha-amino-containing residues include imidoesters such as methyl picolinimide; pyridoxal phosphate; pyridoxal; chloroborohydride; trinitrobenzenesulfonic acid; O-methylisourea; 2,4 pentanedione; and transaminase-catalyzed reaction with glyoxylate.

Arginyl residues may be modified by reaction with any one or combination of several conventional reagents, including phenylglyoxal, 2,3-butanedione, 1,2-cyclohexanedione, and ninhydrin. Derivatization of arginyl residues requires that the reaction be performed in alkaline conditions because of the high pKa of the guanidine functional group. Furthermore, these reagents may react with the groups of lysine as well as the arginine epsilon-amino group.

Specific modification of tyrosyl residues has been studied extensively, with particular interest in introducing spectral labels into tyrosyl residues by reaction with aromatic diazonium compounds or tetranitromethane. Most commonly, N-acetylimidazole and tetranitromethane are used to form O-acetyl tyrosyl species and 3-nitro derivatives, respectively.

Carboxyl sidechain groups (aspartyl or glutamyl) may be selectively modified by reaction with carbodiimides ($R'-N=C=N-R'$) such as 1-cyclohexyl-3-(2-morpholinyl-(4-ethyl) carbodiimide or 1-ethyl-3-(4-azonia-4,4-dimethylpentyl) carbodiimide. Furthermore, aspartyl and glutamyl residues may be converted to asparaginyl and glutaminyl residues by reaction with ammonium ions.

Glutaminyl and asparaginyl residues may be deamidated to the corresponding glutamyl and aspartyl residues. Alternatively, these residues are deamidated under mildly acidic conditions. Either form of these residues falls within the scope of this invention.

Cysteinyl residues can be replaced by amino acid residues or other moieties either to eliminate disulfide bonding or, conversely, to stabilize cross-linking. See, e.g., Bhatnagar *et al.* (1996), *J. Med. Chem.* 39: 3814-9.

Derivatization with bifunctional agents is useful for cross-linking the peptides or their functional derivatives to a water-insoluble support matrix or to other macromolecular vehicles. Commonly used cross-linking agents include, e.g., 1,1-bis(diazoacetyl)-2-phenylethane, glutaraldehyde, N-hydroxysuccinimide esters, for example, esters with 4-azidosalicylic acid, homobifunctional imidoesters, including disuccinimidyl esters such as 3,3'-dithiobis(succinimidylpropionate), and bifunctional maleimides such as bis-N-maleimido-1,8-octane. Derivatizing agents such as methyl-3-[(p-azidophenyl)dithio]propioimide yield photoactivatable intermediates that are capable of forming crosslinks in the presence of light. Alternatively, reactive water-insoluble matrices such as cyanogen bromide-activated carbohydrates

and the reactive substrates described in U.S. Pat. Nos. 3,969,287; 3,691,016; 4,195,128; 4,247,642; 4,229,537; and 4,330,440 are employed for protein immobilization.

Carbohydrate (oligosaccharide) groups may conveniently be
5 attached to sites that are known to be glycosylation sites in proteins. Generally, O-linked oligosaccharides are attached to serine (Ser) or threonine (Thr) residues while N-linked oligosaccharides are attached to asparagine (Asn) residues when they are part of the sequence Asn-X-Ser/Thr, where X can be any amino acid except proline. X is preferably
10 one of the 19 naturally occurring amino acids other than proline. The structures of N-linked and O-linked oligosaccharides and the sugar residues found in each type are different. One type of sugar that is commonly found on both is N-acetylneuraminic acid (referred to as sialic acid). Sialic acid is usually the terminal residue of both N-linked and O-
15 linked oligosaccharides and, by virtue of its negative charge, may confer acidic properties to the glycosylated compound. Such site(s) may be incorporated in the linker of the compounds of this invention and are preferably glycosylated by a cell during recombinant production of the polypeptide compounds (e.g., in mammalian cells such as CHO, BHK,
20 COS). However, such sites may further be glycosylated by synthetic or semi-synthetic procedures known in the art.

Other possible modifications include hydroxylation of proline and lysine, phosphorylation of hydroxyl groups of seryl or threonyl residues, oxidation of the sulfur atom in Cys, methylation of the alpha-amino
25 groups of lysine, arginine, and histidine side chains. Creighton, Proteins: Structure and Molecule Properties (W. H. Freeman & Co., San Francisco), pp. 79-86 (1983).

Compounds of the present invention may be changed at the DNA level, as well. The DNA sequence of any portion of the compound may be

changed to codons more compatible with the chosen host cell. For E. coli, which is the preferred host cell, optimized codons are known in the art. Codons may be substituted to eliminate restriction sites or to include silent restriction sites, which may aid in processing of the DNA in the selected
5 host cell. The vehicle, linker and peptide DNA sequences may be modified to include any of the foregoing sequence changes.

Methods of Making

The compounds of this invention largely may be made in transformed host cells using recombinant DNA techniques. To do so, a
10 recombinant DNA molecule coding for the peptide is prepared. Methods of preparing such DNA molecules are well known in the art. For instance, sequences coding for the peptides could be excised from DNA using suitable restriction enzymes. Alternatively, the DNA molecule could be synthesized using chemical synthesis techniques, such as the
15 phosphoramidate method. Also, a combination of these techniques could be used.

The invention also includes a vector capable of expressing the peptides in an appropriate host. The vector comprises the DNA molecule that codes for the peptides operatively linked to appropriate expression
20 control sequences. Methods of effecting this operative linking, either before or after the DNA molecule is inserted into the vector, are well known. Expression control sequences include promoters, activators, enhancers, operators, ribosomal binding sites, start signals, stop signals, cap signals, polyadenylation signals, and other signals involved with the
25 control of transcription or translation.

The resulting vector having the DNA molecule thereon is used to transform an appropriate host. This transformation may be performed using methods well known in the art.

Any of a large number of available and well-known host cells may be used in the practice of this invention. The selection of a particular host is dependent upon a number of factors recognized by the art. These include, for example, compatibility with the chosen expression vector, toxicity of the peptides encoded by the DNA molecule, rate of transformation, ease of recovery of the peptides, expression characteristics, bio-safety and costs. A balance of these factors must be struck with the understanding that not all hosts may be equally effective for the expression of a particular DNA sequence. Within these general guidelines, useful microbial hosts include bacteria (such as E. coli sp.), yeast (such as Saccharomyces sp.) and other fungi, insects, plants, mammalian (including human) cells in culture, or other hosts known in the art.

Next, the transformed host is cultured and purified. Host cells may be cultured under conventional fermentation conditions so that the desired compounds are expressed. Such fermentation conditions are well known in the art. Finally, the peptides are purified from culture by methods well known in the art.

The compounds may also be made by synthetic methods. For example, solid phase synthesis techniques may be used. Suitable techniques are well known in the art, and include those described in Merrifield (1973), Chem. Polypeptides, pp. 335-61 (Katsoyannis and Panayotis eds.); Merrifield (1963), J. Am. Chem. Soc. 85: 2149; Davis et al. (1985), Biochem. Intl. 10: 394-414; Stewart and Young (1969), Solid Phase Peptide Synthesis; U.S. Pat. No. 3,941,763; Finn et al. (1976), The Proteins (3rd ed.) 2: 105-253; and Erickson et al. (1976), The Proteins (3rd ed.) 2: 257-527. Solid phase synthesis is the preferred technique of making individual peptides since it is the most cost-effective method of making small peptides.

Compounds that contain derivatized peptides or which contain non-peptide groups may be synthesized by well-known organic chemistry techniques.

Uses of the Compounds

In general. The compounds of this invention have pharmacologic activity resulting from their ability to bind to proteins of interest as agonists, mimetics or antagonists of the native ligands of such proteins of interest. The utility of specific compounds is shown in Table 2. The activity of these compounds can be measured by assays known in the art. For the TPO-mimetic and EPO-mimetic compounds, in vivo assays are further described in the Examples section herein.

In addition to therapeutic uses, the compounds of the present invention are useful in diagnosing diseases characterized by dysfunction of their associated protein of interest. In one embodiment, a method of detecting in a biological sample a protein of interest (e.g., a receptor) that is capable of being activated comprising the steps of: (a) contacting the sample with a compound of this invention; and (b) detecting activation of the protein of interest by the compound. The biological samples include tissue specimens, intact cells, or extracts thereof. The compounds of this invention may be used as part of a diagnostic kit to detect the presence of their associated proteins of interest in a biological sample. Such kits employ the compounds of the invention having an attached label to allow for detection. The compounds are useful for identifying normal or abnormal proteins of interest. For the EPO-mimetic compounds, for example, presence of abnormal protein of interest in a biological sample may be indicative of such disorders as Diamond Blackfan anemia, where it is believed that the EPO receptor is dysfunctional.

Therapeutic uses of EPO-mimetic compounds. The EPO-mimetic compounds of the invention are useful for treating disorders characterized by low red blood cell levels. Included in the invention are methods of modulating the endogenous activity of an EPO receptor in a mammal, preferably methods of increasing the activity of an EPO receptor. In

general, any condition treatable by erythropoietin, such as anemia, may also be treated by the EPO-mimetic compounds of the invention. These compounds are administered by an amount and route of delivery that is appropriate for the nature and severity of the condition being treated and
5 may be ascertained by one skilled in the art. Preferably, administration is by injection, either subcutaneous, intramuscular, or intravenous.

Therapeutic uses of TPO-mimetic compounds. For the TPO-mimetic compounds, one can utilize such standard assays as those described in WO95/26746 entitled "Compositions and Methods for
10 Stimulating Megakaryocyte Growth and Differentiation". In vivo assays also appear in the Examples hereinafter.

The conditions to be treated are generally those that involve an existing megakaryocyte/platelet deficiency or an expected megakaryocyte/platelet deficiency (e.g., because of planned surgery or
15 platelet donation). Such conditions will usually be the result of a deficiency (temporary or permanent) of active Mpl ligand in vivo. The generic term for platelet deficiency is thrombocytopenia, and hence the methods and compositions of the present invention are generally available for treating thrombocytopenia in patients in need thereof.

20 Thrombocytopenia (platelet deficiencies) may be present for various reasons, including chemotherapy and other therapy with a variety of drugs, radiation therapy, surgery, accidental blood loss, and other specific disease conditions. Exemplary specific disease conditions that involve thrombocytopenia and may be treated in accordance with this
25 invention are: aplastic anemia, idiopathic thrombocytopenia, metastatic tumors which result in thrombocytopenia, systemic lupus erythematosus, splenomegaly, Fanconi's syndrome, vitamin B12 deficiency, folic acid deficiency, May-Hegglin anomaly, Wiskott-Aldrich syndrome, and paroxysmal nocturnal hemoglobinuria. Also, certain treatments for AIDS

result in thrombocytopenia (e.g., AZT). Certain wound healing disorders might also benefit from an increase in platelet numbers.

With regard to anticipated platelet deficiencies, e.g., due to future surgery, a compound of the present invention could be administered
5 several days to several hours prior to the need for platelets. With regard to acute situations, e.g., accidental and massive blood loss, a compound of this invention could be administered along with blood or purified platelets.

The TPO-mimetic compounds of this invention may also be useful in
10 stimulating certain cell types other than megakaryocytes if such cells are found to express Mpl receptor. Conditions associated with such cells that express the Mpl receptor, which are responsive to stimulation by the Mpl ligand, are also within the scope of this invention.

The TPO-mimetic compounds of this invention may be used in any
15 situation in which production of platelets or platelet precursor cells is desired, or in which stimulation of the c-Mpl receptor is desired. Thus, for example, the compounds of this invention may be used to treat any condition in a mammal wherein there is a need of platelets, megakaryocytes, and the like. Such conditions are described in detail in the following exemplary sources:
20 WO95/26746; WO95/21919; WO95/18858; WO95/21920 and are incorporated herein.

The TPO-mimetic compounds of this invention may also be useful in maintaining the viability or storage life of platelets and/or megakaryocytes and related cells. Accordingly, it could be useful to include an effective amount of
25 one or more such compounds in a composition containing such cells.

The therapeutic methods, compositions and compounds of the present invention may also be employed, alone or in combination with other cytokines, soluble Mpl receptor, hematopoietic factors, interleukins, growth factors or antibodies in the treatment of disease states

characterized by other symptoms as well as platelet deficiencies. It is anticipated that the inventive compound will prove useful in treating some forms of thrombocytopenia in combination with general stimulators of hematopoiesis, such as IL-3 or GM-CSF. Other megakaryocytic stimulatory factors, i.e., meg-CSF, stem cell factor (SCF), leukemia inhibitory factor (LIF), oncostatin M (OSM), or other molecules with megakaryocyte stimulating activity may also be employed with Mpl ligand. Additional exemplary cytokines or hematopoietic factors for such co-administration include IL-1 alpha, IL-1 beta, IL-2, IL-3, IL-4, IL-5, IL-6, IL-11, colony stimulating factor-1 (CSF-1), SCF, GM-CSF, granulocyte colony stimulating factor (G-CSF), EPO, interferon-alpha (IFN-alpha), consensus interferon, IFN-beta, or IFN-gamma. It may further be useful to administer, either simultaneously or sequentially, an effective amount of a soluble mammalian Mpl receptor, which appears to have an effect of causing megakaryocytes to fragment into platelets once the megakaryocytes have reached mature form. Thus, administration of an inventive compound (to enhance the number of mature megakaryocytes) followed by administration of the soluble Mpl receptor (to inactivate the ligand and allow the mature megakaryocytes to produce platelets) is expected to be a particularly effective means of stimulating platelet production. The dosage recited above would be adjusted to compensate for such additional components in the therapeutic composition. Progress of the treated patient can be monitored by conventional methods.

In cases where the inventive compounds are added to compositions of platelets and/or megakaryocytes and related cells, the amount to be included will generally be ascertained experimentally by techniques and assays known in the art. An exemplary range of amounts is 0.1 μg —1 mg inventive compound per 10^6 cells.

Pharmaceutical Compositions

In General. The present invention also provides methods of using pharmaceutical compositions of the inventive compounds. Such pharmaceutical compositions may be for administration for injection, or for oral, pulmonary, nasal, transdermal or other forms of administration. In general, the invention encompasses pharmaceutical compositions comprising effective amounts of a compound of the invention together with pharmaceutically acceptable diluents, preservatives, solubilizers, emulsifiers, adjuvants and/or carriers. Such compositions include diluents of various buffer content (*e.g.*, Tris-HCl, acetate, phosphate), pH and ionic strength; additives such as detergents and solubilizing agents (*e.g.*, Tween 80, Polysorbate 80), anti-oxidants (*e.g.*, ascorbic acid, sodium metabisulfite), preservatives (*e.g.*, Thimersol, benzyl alcohol) and bulking substances (*e.g.*, lactose, mannitol); incorporation of the material into particulate preparations of polymeric compounds such as polylactic acid, polyglycolic acid, etc. or into liposomes. Hyaluronic acid may also be used, and this may have the effect of promoting sustained duration in the circulation. Such compositions may influence the physical state, stability, rate of in vivo release, and rate of in vivo clearance of the present proteins and derivatives. See, *e.g.*, Remington's Pharmaceutical Sciences, 18th Ed. (1990, Mack Publishing Co., Easton, PA 18042) pages 1435-1712 which are herein incorporated by reference. The compositions may be prepared in liquid form, or may be in dried powder, such as lyophilized form. Implantable sustained release formulations are also contemplated, as are transdermal formulations.

Oral dosage forms. Contemplated for use herein are oral solid dosage forms, which are described generally in Chapter 89 of Remington's Pharmaceutical Sciences (1990), 18th Ed., Mack Publishing Co. Easton PA 18042, which is herein incorporated by reference. Solid dosage forms include tablets, capsules, pills, troches or lozenges, cachets or pellets. Also,

liposomal or proteinoid encapsulation may be used to formulate the present compositions (as, for example, proteinoid microspheres reported in U.S. Patent No. 4,925,673). Liposomal encapsulation may be used and the liposomes may be derivatized with various polymers (e.g., U.S. Patent
5 No. 5,013,556). A description of possible solid dosage forms for the therapeutic is given in Chapter 10 of Marshall, K., Modern Pharmaceutics (1979), edited by G. S. Banker and C. T. Rhodes, herein incorporated by reference. In general, the formulation will include the inventive compound, and inert ingredients which allow for protection against the
10 stomach environment, and release of the biologically active material in the intestine.

Also specifically contemplated are oral dosage forms of the above inventive compounds. If necessary, the compounds may be chemically modified so that oral delivery is efficacious. Generally, the chemical
15 modification contemplated is the attachment of at least one moiety to the compound molecule itself, where said moiety permits (a) inhibition of proteolysis; and (b) uptake into the blood stream from the stomach or intestine. Also desired is the increase in overall stability of the compound and increase in circulation time in the body. Moieties useful as covalently
20 attached vehicles in this invention may also be used for this purpose. Examples of such moieties include: PEG, copolymers of ethylene glycol and propylene glycol, carboxymethyl cellulose, dextran, polyvinyl alcohol, polyvinyl pyrrolidone and polyproline. See, for example, Abuchowski and Davis, Soluble Polymer-Enzyme Adducts, Enzymes as Drugs (1981),
25 Hocenberg and Roberts, eds., Wiley-Interscience, New York, NY, , pp 367-83; Newmark, et al. (1982), J. Appl. Biochem. 4:185-9. Other polymers that could be used are poly-1,3-dioxolane and poly-1,3,6-tioxocane. Preferred for pharmaceutical usage, as indicated above, are PEG moieties.

For oral delivery dosage forms, it is also possible to use a salt of a modified aliphatic amino acid, such as sodium N-(8-[2-hydroxybenzoyl] amino) caprylate (SNAC), as a carrier to enhance absorption of the therapeutic compounds of this invention. The clinical efficacy of a heparin
5 formulation using SNAC has been demonstrated in a Phase II trial conducted by Emisphere Technologies. See US Patent No. 5,792,451, "Oral drug delivery composition and methods".

The compounds of this invention can be included in the formulation as fine multiparticulates in the form of granules or pellets of
10 particle size about 1 mm. The formulation of the material for capsule administration could also be as a powder, lightly compressed plugs or even as tablets. The therapeutic could be prepared by compression.

Colorants and flavoring agents may all be included. For example, the protein (or derivative) may be formulated (such as by liposome or
15 microsphere encapsulation) and then further contained within an edible product, such as a refrigerated beverage containing colorants and flavoring agents.

One may dilute or increase the volume of the compound of the invention with an inert material. These diluents could include
20 carbohydrates, especially mannitol, α -lactose, anhydrous lactose, cellulose, sucrose, modified dextrans and starch. Certain inorganic salts may also be used as fillers including calcium triphosphate, magnesium carbonate and sodium chloride. Some commercially available diluents are Fast-Flo, Emdex, STA-Rx 1500, Emcompress and Avicell.

25 Disintegrants may be included in the formulation of the therapeutic into a solid dosage form. Materials used as disintegrants include but are not limited to starch including the commercial disintegrant based on starch, Explotab. Sodium starch glycolate, Amberlite, sodium carboxymethylcellulose, ultramylopectin, sodium alginate, gelatin, orange

peel, acid carboxymethyl cellulose, natural sponge and bentonite may all be used. Another form of the disintegrants are the insoluble cationic exchange resins. Powdered gums may be used as disintegrants and as binders and these can include powdered gums such as agar, Karaya or tragacanth. Alginic acid and its sodium salt are also useful as disintegrants.

Binders may be used to hold the therapeutic agent together to form a hard tablet and include materials from natural products such as acacia, tragacanth, starch and gelatin. Others include methyl cellulose (MC), ethyl cellulose (EC) and carboxymethyl cellulose (CMC). Polyvinyl pyrrolidone (PVP) and hydroxypropylmethyl cellulose (HPMC) could both be used in alcoholic solutions to granulate the therapeutic.

An antifrictional agent may be included in the formulation of the therapeutic to prevent sticking during the formulation process. Lubricants may be used as a layer between the therapeutic and the die wall, and these can include but are not limited to; stearic acid including its magnesium and calcium salts, polytetrafluoroethylene (PTFE), liquid paraffin, vegetable oils and waxes. Soluble lubricants may also be used such as sodium lauryl sulfate, magnesium lauryl sulfate, polyethylene glycol of various molecular weights, Carbowax 4000 and 6000.

Glidants that might improve the flow properties of the drug during formulation and to aid rearrangement during compression might be added. The glidants may include starch, talc, pyrogenic silica and hydrated silicoaluminate.

To aid dissolution of the compound of this invention into the aqueous environment a surfactant might be added as a wetting agent. Surfactants may include anionic detergents such as sodium lauryl sulfate, dioctyl sodium sulfosuccinate and dioctyl sodium sulfonate. Cationic detergents might be used and could include benzalkonium chloride or

benzethonium chloride. The list of potential nonionic detergents that could be included in the formulation as surfactants are lauromacrogol 400, polyoxyl 40 stearate, polyoxyethylene hydrogenated castor oil 10, 50 and 60, glycerol monostearate, polysorbate 40, 60, 65 and 80, sucrose fatty acid ester, methyl cellulose and carboxymethyl cellulose. These surfactants could be present in the formulation of the protein or derivative either alone or as a mixture in different ratios.

Additives may also be included in the formulation to enhance uptake of the compound. Additives potentially having this property are for instance the fatty acids oleic acid, linoleic acid and linolenic acid.

Controlled release formulation may be desirable. The compound of this invention could be incorporated into an inert matrix which permits release by either diffusion or leaching mechanisms e.g., gums. Slowly degenerating matrices may also be incorporated into the formulation, e.g., alginates, polysaccharides. Another form of a controlled release of the compounds of this invention is by a method based on the Oros therapeutic system (Alza Corp.), i.e., the drug is enclosed in a semipermeable membrane which allows water to enter and push drug out through a single small opening due to osmotic effects. Some enteric coatings also have a delayed release effect.

Other coatings may be used for the formulation. These include a variety of sugars which could be applied in a coating pan. The therapeutic agent could also be given in a film coated tablet and the materials used in this instance are divided into 2 groups. The first are the nonenteric materials and include methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, methylhydroxy-ethyl cellulose, hydroxypropyl cellulose, hydroxypropyl-methyl cellulose, sodium carboxy-methyl cellulose, providone and the polyethylene glycols. The second group consists of the enteric materials that are commonly esters of phthalic acid.

A mix of materials might be used to provide the optimum film coating. Film coating may be carried out in a pan coater or in a fluidized bed or by compression coating.

Pulmonary delivery forms. Also contemplated herein is pulmonary
5 delivery of the present protein (or derivatives thereof). The protein (or
derivative) is delivered to the lungs of a mammal while inhaling and
traverses across the lung epithelial lining to the blood stream. (Other
reports of this include Adjei et al., Pharma. Res. (1990) 7: 565-9; Adjei et al.
(1990), Internatl. J. Pharmaceutics 63: 135-44 (leuprolide acetate); Braquet
10 et al. (1989), J. Cardiovasc. Pharmacol. 13 (suppl.5): s.143-146 (endothelin-
1); Hubbard et al. (1989), Annals Int. Med. 3: 206-12 (α 1-antitrypsin); Smith
et al. (1989), J. Clin. Invest. 84: 1145-6 (α 1-proteinase); Oswein et al. (March
1990), "Aerosolization of Proteins", Proc. Symp. Resp. Drug Delivery II,
Keystone, Colorado (recombinant human growth hormone); Debs et al.
15 (1988), J. Immunol. 140: 3482-8 (interferon- γ and tumor necrosis factor α)
and Platz et al., U.S. Patent No. 5,284,656 (granulocyte colony stimulating
factor).

Contemplated for use in the practice of this invention are a wide
range of mechanical devices designed for pulmonary delivery of
20 therapeutic products, including but not limited to nebulizers, metered
dose inhalers, and powder inhalers, all of which are familiar to those
skilled in the art. Some specific examples of commercially available
devices suitable for the practice of this invention are the Ultravent
nebulizer, manufactured by Mallinckrodt, Inc., St. Louis, Missouri; the
25 Acorn II nebulizer, manufactured by Marquest Medical Products,
Englewood, Colorado; the Ventolin metered dose inhaler, manufactured
by Glaxo Inc., Research Triangle Park, North Carolina; and the Spinhaler
powder inhaler, manufactured by Fisons Corp., Bedford, Massachusetts.

All such devices require the use of formulations suitable for the dispensing of the inventive compound. Typically, each formulation is specific to the type of device employed and may involve the use of an appropriate propellant material, in addition to diluents, adjuvants
5 and/or carriers useful in therapy.

The inventive compound should most advantageously be prepared in particulate form with an average particle size of less than 10 μm (or microns), most preferably 0.5 to 5 μm , for most effective delivery to the distal lung.

10 Pharmaceutically acceptable carriers include carbohydrates such as trehalose, mannitol, xylitol, sucrose, lactose, and sorbitol. Other ingredients for use in formulations may include DPPC, DOPE, DSPC and DOPC. Natural or synthetic surfactants may be used. PEG may be used (even apart from its use in derivatizing the protein or analog). Dextrans,
15 such as cyclodextran, may be used. Bile salts and other related enhancers may be used. Cellulose and cellulose derivatives may be used. Amino acids may be used, such as use in a buffer formulation.

Also, the use of liposomes, microcapsules or microspheres, inclusion complexes, or other types of carriers is contemplated.

20 Formulations suitable for use with a nebulizer, either jet or ultrasonic, will typically comprise the inventive compound dissolved in water at a concentration of about 0.1 to 25 mg of biologically active protein per mL of solution. The formulation may also include a buffer and a simple sugar (e.g., for protein stabilization and regulation of osmotic
25 pressure). The nebulizer formulation may also contain a surfactant, to reduce or prevent surface induced aggregation of the protein caused by atomization of the solution in forming the aerosol.

Formulations for use with a metered-dose inhaler device will generally comprise a finely divided powder containing the inventive

compound suspended in a propellant with the aid of a surfactant. The propellant may be any conventional material employed for this purpose, such as a chlorofluorocarbon, a hydrochlorofluorocarbon, a hydrofluorocarbon, or a hydrocarbon, including trichlorofluoromethane, dichlorodifluoromethane, dichlorotetrafluoroethanol, and 1,1,1,2-
5 tetrafluoroethane, or combinations thereof. Suitable surfactants include sorbitan trioleate and soya lecithin. Oleic acid may also be useful as a surfactant.

Formulations for dispensing from a powder inhaler device will
10 comprise a finely divided dry powder containing the inventive compound and may also include a bulking agent, such as lactose, sorbitol, sucrose, mannitol, trehalose, or xylitol in amounts which facilitate dispersal of the powder from the device, e.g., 50 to 90% by weight of the formulation.

Nasal delivery forms. Nasal delivery of the inventive compound is
15 also contemplated. Nasal delivery allows the passage of the protein to the blood stream directly after administering the therapeutic product to the nose, without the necessity for deposition of the product in the lung. Formulations for nasal delivery include those with dextran or cyclodextran. Delivery via transport across other mucous membranes is
20 also contemplated.

Dosages. The dosage regimen involved in a method for treating the above-described conditions will be determined by the attending physician, considering various factors which modify the action of drugs, e.g. the age, condition, body weight, sex and diet of the patient, the severity of any infection,
25 time of administration and other clinical factors. Generally, the daily regimen should be in the range of 0.1-1000 micrograms of the inventive compound per kilogram of body weight, preferably 0.1-150 micrograms per kilogram.

Specific preferred embodiments

The inventors have determined preferred peptide sequences for molecules having many different kinds of activity. The inventors have further determined preferred structures of these preferred peptides combined with preferred linkers and vehicles. Preferred structures for these preferred peptides listed in Table 21 below.

Table 21—Preferred embodiments

Sequence/structure	SEQ ID NO:	Activity
F ¹ -(G) ₅ -IEGPTLRQWLAARA-(G) ₈ -IEGPTLRQWLAARA	337	TPO-mimetic
IEGPTLRQWLAARA-(G) ₈ -IEGPTLRQWLAARA-(G) ₅ -F ¹	338	TPO-mimetic
F ¹ -(G) ₅ -IEGPTLRQWLAARA	1032	TPO-mimetic
IEGPTLRQWLAARA -(G) ₅ -F ¹	1033	TPO-mimetic
F ¹ -(G) ₅ -GGTYSCHFGPLTWVCKPQGG-(G) ₄ -GGTYSCHFGPLTWVCKPQGG	339	EPO-mimetic
GGTYSCHFGPLTWVCKPQGG-(G) ₄ -GGTYSCHFGPLTWVCKPQGG-(G) ₅ -F ¹	340	EPO-mimetic
GGTYSCHFGPLTWVCKPQGG-(G) ₅ -F ¹	1034	EPO-mimetic
F ¹ -(G) ₅ -DFLPHYKNTSLGHRP	1045	TNF- α inhibitor
DFLPHYKNTSLGHRP-(G) ₅ -F ¹	1046	TNF- α inhibitor
F ¹ -(G) ₅ -FEWTPGYWQPYALPL	1047	IL-1 R antagonist
FEWTPGYWQPYALPL-(G) ₅ -F ¹	1048	IL-1 R antagonist
F ¹ -(G) ₅ -VEPNCDIHVMWEWECFERL	1049	VEGF-antagonist
VEPNCDIHVMWEWECFERL-(G) ₅ -F ¹	1050	VEGF-antagonist
F ¹ -(G) ₅ -CTTHWGFTLC	1051	MMP inhibitor
CTTHWGFTLC-(G) ₅ -F ¹	1052	MMP inhibitor

"F¹" is an Fc domain as defined previously herein.

Working examples

The compounds described above may be prepared as described below. These examples comprise preferred embodiments of the invention and are illustrative rather than limiting.

Example 1

5

TPO-Mimetics

The following example uses peptides identified by the numbers appearing in Table A hereinafter.

Preparation of peptide 19. Peptide 17b (12 mg) and MeO-PEG-SH 5000 (30 mg, 2 equiv.) were dissolved in 1 ml aqueous buffer (pH 8). The mixture was incubated at RT for about 30 minutes and the reaction was checked by analytical HPLC, which showed a > 80% completion of the reaction. The pegylated material was isolated by preparative HPLC.

Preparation of peptide 20. Peptide 18 (14 mg) and MeO-PEG-maleimide (25 mg) were dissolved in about 1.5 ml aqueous buffer (pH 8). The mixture was incubated at RT for about 30 minutes, at which time about 70% transformation was complete as monitored with analytical HPLC by applying an aliquot of sample to the HPLC column. The pegylated material was purified by preparative HPLC.

Bioactivity assay. The TPO in vitro bioassay is a mitogenic assay utilizing an IL-3 dependent clone of murine 32D cells that have been transfected with human mpl receptor. This assay is described in greater detail in WO 95/26746. Cells are maintained in MEM medium containing 10% Fetal Clone II and 1 ng/ml mIL-3. Prior to sample addition, cells are prepared by rinsing twice with growth medium lacking mIL-3. An extended twelve point TPO standard curve is prepared, ranging from 33 to 39 pg/ml. Four dilutions, estimated to fall within the linear portion of the standard curve, (100 to 125 pg/ml), are prepared for each sample and run in triplicate. A volume of 100 μ l of each dilution of sample or standard is added to appropriate wells of a 96 well microtiter plate

containing 10,000 cells/well. After forty-four hours at 37 °C and 10% CO₂, MTS (a tetrazolium compound which is bio-reduced by cells to a formazan) is added to each well. Approximately six hours later, the optical density is read on a plate reader at 490 nm. A dose response curve (log TPO

5 concentration vs. O.D.- Background) is generated and linear regression analysis of points which fall in the linear portion of the standard curve is performed. Concentrations of unknown test samples are determined using the resulting linear equation and a correction for the dilution factor.

TMP tandem repeats with polyglycine linkers. Our design of
10 sequentially linked TMP repeats was based on the assumption that a dimeric form of TMP was required for its effective interaction with c-Mpl (the TPO receptor) and that depending on how they were wound up against each other in the receptor context, the two TMP molecules could be tethered together in the C- to N-terminus configuration in a way that
15 would not perturb the global dimeric conformation. Clearly, the success of the design of tandem linked repeats depends on proper selection of the length and composition of the linker that joins the C- and N-termini of the two sequentially aligned TMP monomers. Since no structural information of the TMP bound to c-Mpl was available, a series of repeated peptides
20 with linkers composed of 0 to 10 and 14 glycine residues (Table A) were synthesized. Glycine was chosen because of its simplicity and flexibility, based on the rationale that a flexible polyglycine peptide chain might allow for the free folding of the two tethered TMP repeats into the required conformation, while other amino acid sequences may adopt
25 undesired secondary structures whose rigidity might disrupt the correct packing of the repeated peptide in the receptor context.

The resulting peptides are readily accessible by conventional solid phase peptide synthesis methods (Merrifield (1963), J. Amer. Chem. Soc. 85: 2149) with either Fmoc or t-Boc chemistry. Unlike the synthesis of the

C-terminally linked parallel dimer which required the use of an orthogonally protected lysine residue as the initial branch point to build the two peptide chains in a pseudosymmetrical way (Cwirla *et al.* (1997), *Science* 276: 1696-9), the synthesis of these tandem repeats was a

5 straightforward, stepwise assembly of the continuous peptide chains from the C- to N-terminus. Since dimerization of TMP had a more dramatic effect on the proliferative activity than binding affinity as shown for the C-terminal dimer (Cwirla *et al.* (1997)), the synthetic peptides were tested directly for biological activity in a TPO-dependent cell-proliferation assay

10 using an IL-3 dependent clone of murine 32D cells transfected with the full-length c-Mpl (Palacios *et al.*, *Cell* 41:727 (1985)). As the test results showed, all the polyglycine linked tandem repeats demonstrated >1000 fold increases in potency as compared to the monomer, and were even more potent than the C-terminal dimer in this cell proliferation assay. The

15 absolute activity of the C-terminal dimer in our assay was lower than that of the native TPO protein, which is different from the previously reported findings in which the C-terminal dimer was found to be as active as the natural ligand (Cwirla *et al.* (1997)). This might be due to differences in the conditions used in the two assays. Nevertheless, the difference in

20 activity between tandem (C terminal of first monomer linked to N terminal of second monomer) and C-terminal (C terminal of first monomer linked to C terminal of second monomer; also referred to as parallel) dimers in the same assay clearly demonstrated the superiority of tandem repeat strategy over parallel peptide dimerization. It is interesting to note

25 that a wide range of length is tolerated by the linker. The optimal linker between tandem peptides with the selected TMP monomers apparently is composed of 8 glycines.

Other tandem repeats. Subsequent to this first series of TMP tandem repeats, several other molecules were designed either with

different linkers or containing modifications within the monomer itself.

The first of these molecules, peptide 13, has a linker composed of GPNG, a sequence known to have a high propensity to form a β -turn-type secondary structure. Although still about 100-fold more potent than the monomer, this peptide was found to be >10-fold less active than the equivalent GGGG-linked analog. Thus, introduction of a relatively rigid β -turn at the linker region seemed to have caused a slight distortion of the optimal agonist conformation in this short linker form.

The Trp9 in the TMP sequence is a highly conserved residue among the active peptides isolated from random peptide libraries. There is also a highly conserved Trp in the consensus sequences of EPO mimetic peptides and this Trp residue was found to be involved in the formation of a hydrophobic core between the two EMPs and contributed to hydrophobic interactions with the EPO receptor. Livnah *et al.* (1996), *Science* 273: 464-71). By analogy, the Trp9 residue in TMP might have a similar function in dimerization of the peptide ligand, and as an attempt to modulate and estimate the effects of noncovalent hydrophobic forces exerted by the two indole rings, several analogs were made resulting from mutations at the Trp. So in peptide 14, the Trp residue was replaced in each of the two TMP monomers with a Cys, and an intramolecular disulfide bond was formed between the two cysteines by oxidation which was envisioned to mimic the hydrophobic interactions between the two Trp residues in peptide dimerization. Peptide 15 is the reduced form of peptide 14. In peptide 16, the two Trp residues were replaced by Ala. As the assay data show, all three analogs were inactive. These data further demonstrated that Trp is critical for the activity of the TPO mimetic peptide, not just for dimer formation.

The next two peptides (peptide 17a, and 18) each contain in their 8-amino acid linker a Lys or Cys residue. These two compounds are

precursors to the two PEGylated peptides (peptide 19 and 20) in which the side chain of the Lys or Cys is modified by a PEG moiety. A PEG moiety was introduced at the middle of a relatively long linker, so that the large PEG component (5 kDa) is far enough away from the critical binding sites in the peptide molecule. PEG is a known biocompatible polymer which is
5 increasingly used as a covalent modifier to improve the pharmacokinetic profiles of peptide- and protein-based therapeutics.



A modular, solution-based method was devised for convenient PEGylation of synthetic or recombinant peptides. The method is based on
10 the now well established chemoselective ligation strategy which utilizes the specific reaction between a pair of mutually reactive functionalities. So, for pegylated peptide 19, the lysine side chain was preactivated with a bromoacetyl group to give peptide 17b to accommodate reaction with a thiol-derivatized PEG. To do that, an orthogonal protecting group, Dde,
15 was employed for the protection of the lysine ϵ -amine. Once the whole peptide chain was assembled, the N-terminal amine was reprotected with t-Boc. Dde was then removed to allow for the bromoacetylation. This strategy gave a high quality crude peptide which was easily purified using conventional reverse phase HPLC. Ligation of the peptide with the thiol-
20 modified PEG took place in aqueous buffer at pH 8 and the reaction completed within 30 minutes. MALDI-MS analysis of the purified, pegylated material revealed a characteristic, bell-shaped spectrum with an increment of 44 Da between the adjacent peaks. For PEG-peptide 20, a cysteine residue was placed in the linker region and its side chain thiol
25 group would serve as an attachment site for a maleimide-containing PEG. Similar conditions were used for the pegylation of this peptide. As the assay data revealed, these two pegylated peptides had even higher in vitro bioactivity as compared to their unpegylated counterparts.

Peptide 21 has in its 8-amino acid linker a potential glycosylation motif, NGS. Since our exemplary tandem repeats are made up of natural amino acids linked by peptide bonds, expression of such a molecule in an appropriate eukaryotic cell system should produce a glycopeptide with the carbohydrate moiety added on the side chain carboxamide of Asn. Glycosylation is a common post-translational modification process which can have many positive impacts on the biological activity of a given protein by increasing its aqueous solubility and *in vivo* stability. As the assay data show, incorporation of this glycosylation motif into the linker maintained high bioactivity. The synthetic precursor of the potential glycopeptide had in effect an activity comparable to that of the $-(G)_8$ -linked analog. Once glycosylated, this peptide is expected to have the same order of activity as the pegylated peptides, because of the similar chemophysical properties exhibited by a PEG and a carbohydrate moiety.

The last peptide is a dimer of a tandem repeat. It was prepared by oxidizing peptide 18, which formed an intermolecular disulfide bond between the two cysteine residues located at the linker. This peptide was designed to address the possibility that TMP was active as a tetramer. The assay data showed that this peptide was not more active than an average tandem repeat on an adjusted molar basis, which indirectly supports the idea that the active form of TMP is indeed a dimer, otherwise dimerization of a tandem repeat would have a further impact on the bioactivity.

In order to confirm the *in vitro* data in animals, one pegylated TMP tandem repeat (compound 20 in Table A) was delivered subcutaneously to normal mice via osmotic pumps. Time and dose-dependent increases were seen in platelet numbers for the duration of treatment. Peak platelet levels over 4-fold baseline were seen on day 8. A dose of $10 \mu\text{g/kg/day}$ of the pegylated TMP repeat produced a similar response to rHuMGDF (non-pegylated) at $100 \mu\text{g/kg/day}$ delivered by the same route.

Table A—TPO-mimetic Peptides

Peptide No.	Compound	SEQ ID NO:	Relative Potency
	TPO		++++
	TMP monomer	13	+
	TMP C-C dimer		+++-
TMP-(G) _n -TMP:			
1	n = 0	341	++++-
2	n = 1	342	++++
3	n = 2	343	++++
4	n = 3	344	++++
5	n = 4	345	++++
6	n = 5	346	++++
7	n = 6	347	++++
8	n = 7	348	++++
9	n = 8	349	++++-
10	n = 9	350	++++
11	n = 10	351	++++
12	n = 14	352	++++
13	TMP-GPNG-TMP	353	+++
14	IEGPTLRQCLAARA-GGGGGGGG-IEGPTLRQCLAARA <div style="text-align: center;">  </div> (cyclic)	354	-
15	IEGPTLRQCLAARA-GGGGGGGG- IEGPTLRQCLAARA (linear)	355	-
16	IEGPTLRQALAARA-GGGGGGGG- IEGPTLRQALAARA	356	-
17a	TMP-GGGKGGGG-TMP	357	++++
17b	TMP-GGGK(BrAc)GGGG-TMP	358	ND
18	TMP-GGGCGGGG-TMP	359	++++
19	TMP-GGGK(PEG)GGGG-TMP	360	+++++
20	TMP-GGGC(PEG)GGGG-TMP	361	+++++
21	TMP-GGGN*GSGG-TMP	362	++++
22	TMP-GGGCGGGG-TMP <div style="text-align: center;">  </div>	363	++++
	TMP-GGGCGGGG-TMP	363	

Discussion. It is well accepted that MGDF acts in a way similar to hGH, i.e., one molecule of the protein ligand binds two molecules of the receptor for its activation. Wells *et al.* (1996), *Ann. Rev. Biochem.* 65: 609-34. Now, this interaction is mimicked by the action of a much smaller peptide, TMP. However, the present studies suggest that this mimicry requires the concerted action of two TMP molecules, as covalent dimerization of TMP in either a C-C parallel or C-N sequential fashion increased the *in vitro* biological potency of the original monomer by a factor of greater than 10^3 . The relatively low biopotency of the monomer is probably due to inefficient formation of the noncovalent dimer. A preformed covalent repeat has the ability to eliminate the entropy barrier for the formation of a noncovalent dimer which is exclusively driven by weak, noncovalent interactions between two molecules of the small, 14-residue peptide.

It is intriguing that this tandem repeat approach had a similar effect on enhancing bioactivity as the reported C-C dimerization is intriguing. These two strategies brought about two very different molecular configurations. The C-C dimer is a quasi-symmetrical molecule, while the tandem repeats have no such symmetry in their linear structures. Despite this difference in their primary structures, these two types of molecules appeared able to fold effectively into a similar biologically active conformation and cause the dimerization and activation of c-Mpl. These experimental observations provide a number of insights into how the two TMP molecules may interact with one another in binding to c-Mpl. First, the two C-termini of the two bound TMP molecules must be in relatively close proximity with each other, as suggested by data on the C-terminal dimer. Second, the respective N- and C-termini of the two TMP molecules in the receptor complex must also be very closely aligned with each other, such that they can be directly tethered together with a single peptide bond

to realize the near maximum activity-enhancing effect brought about by the tandem repeat strategy. Insertion of one or more (up to 14) glycine residues at the junction did not increase (or decrease) significantly the activity any further. This may be due to the fact that a flexible polyglycine peptide chain is able to loop out easily from the junction without causing any significant changes in the overall conformation. This flexibility seems to provide the freedom of orientation for the TMP peptide chains to fold into the required conformation in interacting with the receptor and validate it as a site of modification. Indirect evidence supporting this came from the study on peptide 13, in which a much more rigid b-turn-forming sequence as the linker apparently forced a deviation of the backbone alignment around the linker which might have resulted in a slight distortion of the optimal conformation, thus resulting in a moderate (10-fold) decrease in activity as compared with the analogous compound with a 4-Gly linker. Third, Trp9 in TMP plays a similar role as Trp13 in EMP, which is involved not only in peptide:peptide interaction for the formation of dimers but also is important for contributing hydrophobic forces in peptide:receptor interaction. Results obtained with the W to C mutant analog, peptide 14, suggest that a covalent disulfide linkage is not sufficient to approximate the hydrophobic interactions provided by the Trp pair and that, being a short linkage, it might bring the two TMP monomers too close, therefore perturbing the overall conformation of the optimal dimeric structure.

An analysis of the possible secondary structure of the TMP peptide can provide further understanding on the interaction between TMP and c-Mpl. This can be facilitated by making reference to the reported structure of the EPO mimetic peptide. Livnah *et al.* (1996), *Science* 273:464-75 The receptor-bound EMP has a b-hairpin structure with a b-turn formed by the highly consensus Gly-Pro-Leu-Thr at the center of its sequence. Instead of

GPLT, TMP has a highly selected GPTL sequence which is likely to form a similar turn. However, this turn-like motif is located near the N-terminal part in TMP. Secondary structure prediction using Chau-Fasman method suggests that the C-terminal half of the peptide has a tendency to adopt a helical conformation. Together with the highly conserved Trp at position 9, this C-terminal helix may contribute to the stabilization of the dimeric structure. It is interesting to note that most of our tandem repeats are more potent than the C-terminal parallel dimer. Tandem repeats seem to give the molecule a better fit conformation than does the C-C parallel dimerization. The seemingly asymmetric feature of a tandem repeat might have brought it closer to the natural ligand which, as an asymmetric molecule, uses two different sites to bind two identical receptor molecules.

Introduction of a PEG moiety was envisaged to enhance the in vivo activity of the modified peptide by providing it a protection against proteolytic degradation and by slowing down its clearance through renal filtration. It was unexpected that pegylation could further increase the in vitro bioactivity of a tandem repeated TMP peptide in the cell-based proliferation assay.

Example 2

Fc-TMP fusions

TMPs (and EMPs as described in Example 3) were expressed in either monomeric or dimeric form as either N-terminal or C-terminal fusions to the Fc region of human IgG1. In all cases, the expression construct utilized the luxPR promoter promoter in the plasmid expression vector pAMG21.

Fc-TMP. A DNA sequence coding for the Fc region of human IgG1 fused in-frame to a monomer of the TPO-mimetic peptide was constructed using standard PCR technology. Templates for PCR reactions were the pFc-A3 vector and a synthetic TMP gene. The synthetic gene was

constructed from the 3 overlapping oligonucleotides (SEQ ID NOS: 364, 365, and 366, respectively) shown below:

5	1842-97	AAA AAA GGA TCC TCG AGA TTA AGC ACG AGC AGC CAG CCA
		CTG ACG CAG AGT CGG ACC
	1842-98	AAA GGT GGA GGT GGT GGT ATC GAA GGT CCG ACT CTG CGT
10	1842-99	CAG TGG CTG GCT GCT CGT GCT TAA TCT CGA GGA TCC TTT
		TTT

These oligonucleotides were annealed to form the duplex encoding an amino acid sequence (SEQ ID NOS: 367 and 368, respectively) shown below:

```

15      AAAGGTGGAGGTGGTGGTATCGAAGGTCCTGCCTCAGTGCCCTGGCTGCTCGTGCT
        1 -----+-----+-----+-----+-----+-----+-----60
            CCAGGCTGAGACGCAGTCACCGACCGACGAGCACGA
    a          K   G   G   G   G   G   I   E   G   P   T   L   R   Q   W   L   A   A   R   A   -
20      TAATCTCGAGGATCCTTTTTT
        61 -----+-----+-----81
            ATTAGAGCTCCTAGGAAAAAA
    a          *

```

25 This duplex was amplified in a PCR reaction using 1842-98 and 1842-97 as
the sense and antisense primers.

The Fc portion of the molecule was generated in a PCR reaction with pFc-A3 using the primers shown below (SEQ ID NOS: 369 and 370):

30 1216-52 AAC ATA AGT ACC TGT AGG ATC G

1830-51 TTCGATACCA CCACCTCCAC CTTTACCCGG AGACAGGGAG AGGCTCTTCTGC

35 The oligonucleotides 1830-51 and 1842-98 contain an overlap of 24 nucleotides, allowing the two genes to be fused together in the correct reading frame by combining the above PCR products in a third reaction using the outside primers, 1216-52 and 1842-97.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to produce the recombinant protein product and to possess the

gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3728.

The nucleotide and amino acid sequences (SEQ ID NOS: 5 and 6) of the fusion protein are shown in Figure 7.

5 Fc-TMP-TMP. A DNA sequence coding for the Fc region of human
IgG1 fused in-frame to a dimer of the TPO-mimetic peptide was
constructed using standard PCR technology. Templates for PCR reactions
were the pFc-A3 vector and a synthetic TMP-TMP gene. The synthetic
gene was constructed from the 4 overlapping oligonucleotides (SEQ ID
10 NOS: 371 to 374, respectively) shown below:

15	1830-52	AAA GGT GGA GGT GGT GGT ATC GAA GGT CCG ACT CTG CGT CAG TGG CTG GCT GCT CGT GCT
	1830-53	ACC TCC ACC ACC AGC ACG AGC AGC CAG CCA CTG ACG CAG AGT CGG ACC
20	1830-54	GGT GGT GGA GGT GGC GGC GGA GGT ATT GAG GGC CCA ACC CTT CGC CAA TGG CTT GCA GCA CGC GCA
	1830-55	AAA AAA AGG ATC CTC GAG ATT ATG CGC GTG CTG CAA GCC ATT GGC GAA GGG TTG GGC CCT CAA TAC CTC CGC CGC C

25 The 4 oligonucleotides were annealed to form the duplex encoding an amino acid sequence (SEQ ID NOS: 375 and 376, respectively) shown below:

```

30      1  AAAGGTGGAGGTGGTGGTATCGAAGGTCCGACTCTGCGTCACTGGCTGGCTGCCTCGTGGCT
      a  -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      K  G  G  G  G  G  I  E  G  P  T  L  R  Q  W  L  A  A  R  A  -
      CCAGGCTGAGACGCAGTCACCGACCGACGAGCACGA
35      61  GGTGGTGGAGGTGGCGGCGGAGGTATTGAGGGCCCAACCCCTTCGCCAATGGCTTGCAGCA
      a  -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      CCACCACCTCCACCGCCGCCTCCATAACTCCCGGGTTGGGAAGCGGTTACCGAACGTCGT
      G  G  G  G  G  G  G  G  I  E  G  P  T  L  R  Q  W  L  A  A  -
      CGCGCA
40      121 -----148
      GCGCGTATTAGAGCTCCTAGGAAAAAAA
      a  R  A  * -

```

45 This duplex was amplified in a PCR reaction using 1830-52 and 1830-55 as the sense and antisense primers.

The Fc portion of the molecule was generated in a PCR reaction with pFc-A3 using the primers 1216-52 and 1830-51 as described above for

Fc-TMP. The full length fusion gene was obtained from a third PCR reaction using the outside primers 1216-52 and 1830-55.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated
 5 into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described in example 1. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3727.

10 The nucleotide and amino acid sequences (SEQ ID NOS: 7 and 8) of the fusion protein are shown in Figure 8.

TMP-TMP-Fc. A DNA sequence coding for a tandem repeat of the TPO-mimetic peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. Templates for PCR reactions
 15 were the EMP-Fc plasmid from strain #3688 (see Example 3) and a synthetic gene encoding the TMP dimer. The synthetic gene for the tandem repeat was constructed from the 7 overlapping oligonucleotides shown below (SEQ ID NOS: 377 to 383, respectively):

20	1885-52	TTT TTT CAT ATG ATC GAA GGT CCG ACT CTG CGT CAG TGG
	1885-53	AGC ACG AGC AGC CAG CCA CTG ACG CAG AGT CGG ACC TTC GAT CAT ATG
25	1885-54	CTG GCT GCT CGT GCT GGT GGA GGC GGT GGG GAC AAA ACT CAC ACA
	1885-55	CTG GCT GCT CGT GCT GGC GGT GGT GGC GGA GGG GGT GGC ATT GAG GGC CCA
30	1885-56	AAG CCA TTG GCG AAG GGT TGG GCC CTC AAT GCC ACC CCC TCC GCC ACC ACC GCC
35	1885-57	ACC CTT CGC CAA TGG CTT GCA GCA CGC GCA GGG GGA GGC GGT GGG GAC AAA ACT
	1885-58	CCC ACC GCC TCC CCC TGC GCG TGC TGC

These oligonucleotides were annealed to form the duplex shown encoding
 40 an amino acid sequence shown below (SEQ ID NOS 384 and 385):

```

          TTTTTCATATGATCGAAGGTCCGACTCTGCGTCAGTGGCTGGCTGCTCGTGCTGGCGGT
1  -----+-----+-----+-----+-----+-----+-----+ 60
          GTATACTAGCTTCCAGGCTGAGACGCAGTCACCGACCGACGAGCACGACCGCCA
5  a          M I E G P T L R Q W L A A R A G G -
          GGTGGCGGAGGGGGTGGCATTGAGGGCCCAACCCTTCGCCAATGGCTGGCTGCTCGTGCT
61 -----+-----+-----+-----+-----+-----+ 120
          CCACCGCCTCCCCCACCCTAACTCCCGGGTTGGGAAGCGGTTACCGAACGTCGTGCGCGT
10 a          G G G G G G I E G P T L R Q W L A A R A -
          GGTGGAGGCGGTGGGGACAAAACCTCTGGCTGCTCGTGCTGGTGGAGGCGGTGGGGACAAA
121 -----+-----+-----+-----+-----+-----+ 180
          CCCCCTCCGCCACCC
15 a          G G G G G D K T L A A R A G G G G G D K -
          ACTCACACA
181 ----- 189
20 a          T H T -

```

This duplex was amplified in a PCR reaction using 1885-52 and 1885-58 as the sense and antisense primers.

The Fc portion of the molecule was generated in a PCR reaction with DNA from the EMP-Fc fusion strain #3688 (see Example 3) using the primers 1885-54 and 1200-54. The full length fusion gene was obtained from a third PCR reaction using the outside primers 1885-52 and 1200-54.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for Fc-EMP herein. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3798.

The nucleotide and amino acid sequences (SEQ ID NOS: 9 and 10) of the fusion protein are shown in Figure 9.

TMP-Fc. A DNA sequence coding for a monomer of the TPO-mimetic peptide fused in-frame to the Fc region of human IgG1 was obtained fortuitously in the ligation in TMP-TMP-Fc, presumably due to the ability of primer 1885-54 to anneal to 1885-53 as well as to 1885-58. A single clone having the correct nucleotide sequence for the TMP-Fc construct was selected and designated Amgen strain #3788.

The nucleotide and amino acid sequences (SEQ ID NOS: 11 and 12) of the fusion protein are shown in Figure 10.

Expression in E. coli. Cultures of each of the pAMG21-Fc-fusion constructs in E. coli GM221 were grown at 37 °C in Luria Broth medium containing 50 mg/ml kanamycin. Induction of gene product expression from the luxPR promoter was achieved following the addition of the synthetic autoinducer N-(3-oxohexanoyl)-DL-homoserine lactone to the culture media to a final concentration of 20 ng/ml. Cultures were incubated at 37 °C for a further 3 hours. After 3 hours, the bacterial cultures were examined by microscopy for the presence of inclusion bodies and were then collected by centrifugation. Refractile inclusion bodies were observed in induced cultures indicating that the Fc-fusions were most likely produced in the insoluble fraction in E. coli. Cell pellets were lysed directly by resuspension in Laemmli sample buffer containing 10% b-mercaptoethanol and were analyzed by SDS-PAGE. In each case, an intense coomassie-stained band of the appropriate molecular weight was observed on an SDS-PAGE gel.

pAMG21. The expression plasmid pAMG21 can be derived from the Amgen expression vector pCFM1656 (ATCC #69576) which in turn be derived from the Amgen expression vector system described in US Patent No. 4,710,473. The pCFM1656 plasmid can be derived from the described pCFM836 plasmid (Patent No. 4,710,473) by:

- (a) destroying the two endogenous NdeI restriction sites by end filling with T4 polymerase enzyme followed by blunt end ligation;
- (b) replacing the DNA sequence between the unique AatII and ClaI restriction sites containing the synthetic P_L promoter with a similar fragment obtained from pCFM636 (patent No. 4,710,473) containing the PL promoter (see SEQ ID NO: 386 below); and

(c) substituting the small DNA sequence between the unique ClaI and KpnI restriction sites with the oligonucleotide having the sequence of SEQ ID NO: 388.

SEQ ID NO: 386:

5 AatII
5' CTAATTCGCTCTCACCTACCAAACAATGCCCCCTGCAAAAAATAAATTCATAT-
3' TGCAGATTAAAGGCGAGAGTGGATGGTTTGTTACGGGGGGACGTTTTTTATTTAAGTATA-

10 -AAAAACATACAGATAACCATCTGCGGTGATAAATTATCTCTGGCGGTGTTGACATAAA-
 -TTTTTTGTATGTCTATTGGTAGACGCCACTATTTAATAGAGACCGCCACAACGTGATTT-

 -TACCACTGGCGGTGATACTGAGCACAT 3'
 -ATGGTGACCGCCACTATGACTCGTGTAGC 5'

Clal

15 SEQ ID NO: 387:

5' CGATTTGATTCTAGAAGGAGGAATAACATATGGTTAACGCGTTGGAATTCGGTAC 3'
3' TAAACTAAGATCTTCCTCCTTATTGTATACCAATTGCGCAACCTTAAGC 5'

Clal

KpnI

20 The expression plasmid pAMG21 can then be derived from pCFM1656 by making a series of site-directed base changes by PCR overlapping oligo mutagenesis and DNA sequence substitutions. Starting with the BglII site (plasmid bp # 180) immediately 5' to the plasmid replication promoter

25 P_{copB} and proceeding toward the plasmid replication genes, the base pair changes are as shown in Table B below.

Table B—Base pair changes resulting in pAMG21

	<u>pAMG21 bp #</u>	<u>bp in pCFM1656</u>	<u>bp changed to in pAMG21</u>
5	# 204	T/A	C/G
	# 428	A/T	G/C
	# 509	G/C	A/T
	# 617	--	insert two G/C bp
	# 679	G/C	T/A
10	# 980	T/A	C/G
	# 994	G/C	A/T
	# 1004	A/T	C/G
	# 1007	C/G	T/A
	# 1028	A/T	T/A
15	# 1047	C/G	T/A
	# 1178	G/C	T/A
	# 1466	G/C	T/A
	# 2028	G/C	bp deletion
	# 2187	C/G	T/A
20	# 2480	A/T	T/A
	# 2499-2502	<u>AGTG</u> TCAC	<u>GTCA</u> CAGT
25	# 2642	<u>TCCGAGC</u> AGGCTCG	7 bp deletion
30	# 3435	G/C	A/T
	# 3446	G/C	A/T
	# 3643	A/T	T/A

The DNA sequence between the unique AatII (position #4364 in pCFM1656) and SacII (position #4585 in pCFM1656) restriction sites is substituted with the DNA sequence (SEQ ID NO: 23) shown in Figures 17A and 17B. During the ligation of the sticky ends of this substitution
 5 DNA sequence, the outside AatII and SacII sites are destroyed. There are unique AatII and SacII sites in the substituted DNA.

GM221 (Amgen #2596). The Amgen host strain #2596 is an E.coli K-12 strain derived from Amgen strain #393. It has been modified to contain both the temperature sensitive lambda repressor cl857s7 in the early ebg
 10 region and the lacI^Q repressor in the late ebg region (68 minutes). The presence of these two repressor genes allows the use of this host with a variety of expression systems, however both of these repressors are irrelevant to the expression from luxP_R. The untransformed host has no antibiotic resistances.

15 The ribosome binding site of the cl857s7 gene has been modified to include an enhanced RBS. It has been inserted into the ebg operon between nucleotide position 1170 and 1411 as numbered in Genbank accession number M64441Gb_Ba with deletion of the intervening ebg sequence. The sequence of the insert is shown below with lower case
 20 letters representing the ebg sequences flanking the insert shown below (SEQ ID NO: 388):

25 ttatttttcgtGCGGCCGCACCATTATCACCGCCAGAGGTAACTAGTCAACACGCACGGTGTAGATATTTAT
 CCCTTGCGGTGATAGATTGAGCACATCGATTTGATTCTAGAAGGAGGGATAATATATGAGCACAAAAAGAAA
 CCATTAACACAAGAGCAGCTTGAGGACGCACGTCGCCTTAAAGCAATTTATGAAAAAAGAAAAATGAACCTG
 GCTTATCCCAGGAATCTGTCGCAGACAAGATGGGGATGGGGCAGTCAGGCGTTGGTGCTTTATTTAATGGCAT
 CAATGCATTAAATGCTTATAACGCCGCATTGCTTACAAAAATTTCTCAAAGTTAGCGTTGAAGAATTTAGCCCT
 TCAATCGCCAGAGAATCTACGAGATGTATGAAGCGGTTAGTATGCAGCCGTCACCTAGAAGTGAGTATGAGTA
 CCCTGTTTTTCTCATGTTTCAGGCAGGGATGTTCTCACCTAAGCTTAGAACCTTTACCAAAGGTGATGCGGAG
 AGATGGGTAAGCACAAACCAAAAAGCCAGTGATTCTGCATTCTGGCTTGAGGTTGAAGGTAATTCATGACCG
 30 CACCAACAGGCTCCAAGCCAAGCTTTCCTGACGGAATGTTAATTCCTCGTTGACCTGAGCAGGCTGTTGAGCC
 AGGTGATTTCTGCATAGCCAGACTTGGGGTGATGAGTTTACCTTCAAGAACTGATCAGGGATAGCGGTCAG
 GTGTTTTTACAACCACTAAACCCACAGTACCCAATGATCCCATGCAATGAGAGTTGTTCCGTTGTGGGGAAAG
 TTATCGCTAGTCAGTGGCCTGAAGAGACGTTTGGCTGATAGACTAGTGGATCCACTAGTgttttctgccc

35 The construct was delivered to the chromosome using a recombinant phage called MMeBg-cl857s7enhanced RBS #4 into F'tet/393. After recombination and resolution only the chromosomal insert described

above remains in the cell. It was renamed F'tet/GM101. F'tet/GM101 was then modified by the delivery of a lacI^Q construct into the ebg operon between nucleotide position 2493 and 2937 as numbered in the Genbank accession number M64441Gb_Ba with the deletion of the intervening ebg sequence. The sequence of the insert is shown below with the lower case letters representing the ebg sequences flanking the insert (SEQ ID NO: 389) shown below:

```

10  ggccgaaaccGACGTCCATCGAATGGTGCAAAACCTTTTCGCGGTATGGCATGATAGCGCCCGGAAGAGAGTCA
    ATTCAGGGTGGTGAATGTGAAACCAGTAACGTTATACGATGTGCGCAGAGTATGCCGGTGTCTCTTATCAGACC
    GTTTCCTCGCGTGGTGAACCAGGCCAGCCACGTTTCTGCGAAAACGCGGGAAAAAGTCGAAGCGGCGATGGCGG
    AGCTGAATTACATTCCCAACCGCGTGGCACAACAACCTGGCGGGCAAACAGTCGCTCCTGATTGGCGTTGCCAC
    CTCCAGTCTGGCCCTGCACGCGCCGTCGCAAATTGTCGCGGCGATTAAATCTCGCGCCGATCAACTGGGTGCC
    AGCGTGGTGGTGTGCGATGGTAGAACGAAGCGGCGTCGAAGCCTGTAAAGCGGCGGTGCACAATCTTCTCGCGC
    AACGCGTCAGTGGGCTGATCATTAACATCCGCTGGATGACCAGGATGCCATTGCTGTGGAAGCTGCCTGCAC
15  TAATGTTCCGGCGTTATTTCTTGATGTCTCTGACCAGACACCCATCAACAGTATTATTTTCTCCCATGAAGAC
    GGTACGCGACTGGGCGTGGAGCATCTGGTCGCATTGGGTCACCAGCAAATCGCGCTGTTAGCGGGGCCATTA
    GTTCTGTCTCGGCGCGTCTGCGTCTGGCTGGCTGGCATAAATATCTCACTCGCAATCAAATTCAGCCGATAGC
    GGAACGGGAAGGCGACTGGAGTGCCATGTCCGGTTTCAACAAACCATGCAAATGCTGAATGAGGGCATCGTT
    CCCACTGCGATGCTGGTTGCCAACGATCAGATGGCGCTGGGCGCAATGCGCGCCATTACCGAGTCCGGGCTGC
20  GCGTTGGTGGGATATCTCGGTAGTGGGATACGACGATACCGAAGACAGCTCATGTTATATCCCGCCGTTAAC
    CACCATCAAACAGGATTTTCGCCTGCTGGGGCAAACAGCGTGGACCGCTTGCTGCAACTCTCTCAGGGCCAG
    GCGGTGAAGGGCAATCAGCTGTTGCCCGTCTCACTGGTGAAAAGAAAACCACCTGGCGCCCAATACGCAAA
    CCGCCTCTCCCGCGCGTTGGCCGATTCATTAATGCAGCTGGCACGACAGGTTTCCCGACTGGAAAGCGGACA
25  GTAAGGTACCATAGGATCCaggcacagga

```

The construct was delivered to the chromosome using a recombinant phage called AGebg-LacIQ#5 into F'tet/GM101. After recombination and resolution only the chromosomal insert described above remains in the cell. It was renamed F'tet/GM221. The F'tet episome was cured from the strain using acridine orange at a concentration of 25 $\mu\text{g/ml}$ in LB. The cured strain was identified as tetracycline sensitive and was stored as GM221.

Expression. Cultures of pAMG21-Fc-TMP-TMP in *E. coli* GM221 in Luria Broth medium containing 50 $\mu\text{g/ml}$ kanamycin were incubated at 37°C prior to induction. Induction of Fc-TMP-TMP gene product expression from the luxPR promoter was achieved following the addition of the synthetic autoinducer N-(3-oxohexanoyl)-DL-homoserine lactone to the culture media to a final concentration of 20 ng/ml and cultures were incubated at 37°C for a further 3 hours. After 3 hours, the bacterial

cultures were examined by microscopy for the presence of inclusion bodies and were then collected by centrifugation. Refractile inclusion bodies were observed in induced cultures indicating that the Fc-TMP-TMP was most likely produced in the insoluble fraction in *E. coli*. Cell pellets
5 were lysed directly by resuspension in Laemmli sample buffer containing 10% β -mercaptoethanol and were analyzed by SDS-PAGE. An intense Coomassie stained band of approximately 30kDa was observed on an SDS-PAGE gel. The expected gene product would be 269 amino acids in length and have an expected molecular weight of about 29.5 kDa.
10 Fermentation was also carried out under standard batch conditions at the 10 L scale, resulting in similar expression levels of the Fc-TMP-TMP to those obtained at bench scale.

Purification of Fc-TMP-TMP. Cells are broken in water (1/10) by high pressure homogenization (2 passes at 14,000 PSI) and inclusion
15 bodies are harvested by centrifugation (4200 RPM in J-6B for 1 hour). Inclusion bodies are solubilized in 6M guanidine, 50mM Tris, 8mM DTT, pH 8.7 for 1 hour at a 1/10 ratio. The solubilized mixture is diluted 20 times into 2M urea, 50 mM tris, 160mM arginine, 3mM cysteine, pH 8.5. The mixture is stirred overnight in the cold and then concentrated about
20 10 fold by ultrafiltration. It is then diluted 3 fold with 10mM Tris, 1.5M urea, pH 9. The pH of this mixture is then adjusted to pH 5 with acetic acid. The precipitate is removed by centrifugation and the supernatant is loaded onto a SP-Sepharose Fast Flow column equilibrated in 20mM NaAc, 100 mM NaCl, pH 5(10mg/ml protein load, room temperature).
25 The protein is eluted off using a 20 column volume gradient in the same buffer ranging from 100mM NaCl to 500mM NaCl. The pool from the column is diluted 3 fold and loaded onto a SP-Sepharose HP column in 20 mM NaAc, 150 mM NaCl, pH 5(10 mg/ml protein load, room temperature). The protein is eluted off using a 20 column volume gradient

in the same buffer ranging from 150 mM NaCl to 400 mM NaCl. The peak is pooled and filtered.

Characterization of Fc-TMP activity. The following is a summary of in vivo data in mice with various compounds of this invention.

5 Mice: Normal female BDF1 approximately 10-12 weeks of age.

Bleed schedule: Ten mice per group treated on day 0, two groups started 4 days apart for a total of 20 mice per group. Five mice bled at each time point, mice were bled a minimum of three times a week. Mice were anesthetized with isoflurane and a total volume of 140-160 μ l of blood was
10 obtained by puncture of the orbital sinus. Blood was counted on a Technicon H1E blood analyzer running software for murine blood. Parameters measured were white blood cells, red blood cells, hematocrit, hemoglobin, platelets, neutrophils.

Treatments: Mice were either injected subcutaneously for a bolus
15 treatment or implanted with 7-day micro-osmotic pumps for continuous delivery. Subcutaneous injections were delivered in a volume of 0.2 ml. Osmotic pumps were inserted into a subcutaneous incision made in the skin between the scapulae of anesthetized mice. Compounds were diluted in PBS with 0.1% BSA. All experiments included one control group,
20 labeled "carrier" that were treated with this diluent only. The concentration of the test articles in the pumps was adjusted so that the calibrated flow rate from the pumps gave the treatment levels indicated in the graphs.

Compounds: A dose titration of the compound was delivered to
25 mice in 7 day micro-osmotic pumps. Mice were treated with various compounds at a single dose of 100 μ g/kg in 7 day osmotic pumps. Some of the same compounds were then given to mice as a single bolus injection.

Activity test results: The results of the activity experiments are shown in Figures 11 and 12. In dose response assays using 7-day micro-

osmotic pumps, the maximum effect was seen with the compound of SEQ ID NO: 18 was at 100 $\mu\text{g/kg/day}$; the 10 $\mu\text{g/kg/day}$ dose was about 50% maximally active and 1 $\mu\text{g/kg/day}$ was the lowest dose at which activity could be seen in this assay system. The compound at 10 $\mu\text{g/kg/day}$ dose
5 was about equally active as 100 $\mu\text{g/kg/day}$ unpegylated rHu-MGDF in the same experiment.

Example 3**Fc-EMP fusions**

Fc-EMP. A DNA sequence coding for the Fc region of human IgG1 fused in-frame to a monomer of the EPO-mimetic peptide was constructed using standard PCR technology. Templates for PCR reactions were a vector containing the Fc sequence (pFc-A3, described in International application WO 97/23614, published July 3, 1997) and a synthetic gene encoding EPO monomer. The synthetic gene for the monomer was constructed from the 4 overlapping oligonucleotides (SEQ ID NOS: 390 to 393, respectively) shown below:

1798-2 TAT GAA AGG TGG AGG TGG TGG TGG AGG TAC TTA CTC TTG
CCA CTT CGG CCC GCT GAC TTG G

1798-3 CGG TTT GCA AAC CCA AGT CAG CGG GCC GAA GTG GCA AGA
GTA AGT ACC TCC ACC ACC ACC TCC ACC TTT CAT

1798-4 GTT TGC AAA CCG CAG GGT GGC GGC GGC GGC GGC GGT GGT
ACC TAT TCC TGT CAT TTT

1798-5 CCA GGT CAG CGG GCC AAA ATG ACA GGA ATA GGT ACC ACC
GCC GCC GCC GCC GCC ACC CTG

The 4 oligonucleotides were annealed to form the duplex encoding an amino acid sequence (SEQ ID NOS: 394 and 395, respectively) shown below:

TATGAAAGGTGGAGGTGGTGGTGGAGGTACTTACTCTTGCCACTTCGGCCCCGCTGACTTG
1+.....+.....+.....+.....+.....+.....+ 60
TACTTTCCACCTCCACCACCACCTCCATGAATGAGAACGGTGAAGCCGGGCGACTGAAC
b M K G G G G G G G T Y S C H F G P L T W -

GGTTTGCAAACCGCAGGGTGGCGGCGGCGGCGGCGGTGACCTATTCCTGTCATTTT
61+.....+.....+.....+.....+.....+.....+ 133
CCAAACGTTTGGCGTCCCACCGCCGCCGCCGCCGCCACCATGGATAAGGACAGTAAACCGGGCGACTGGACC
b V C K P Q G G G G G G G G T Y S C H F -

This duplex was amplified in a PCR reaction using

1798-18 GCA GAA GAG CCT CTC CCT GTC TCC GGG TAA
AGG TGG AGG TGG TGG TGG AGG TAC TTA
CTC T

and

1798-19 CTA ATT GGA TCC ACG AGA TTA ACC ACC
CTG CGG TTT GCA A

as the sense and antisense primers (SEQ ID NOS: 396 and 397, respectively).

The Fc portion of the molecule was generated in a PCR reaction with pFc-A3 using the primers

5
1216-52 AAC ATA AGT ACC TGT AGG ATC G
1798-17 AGA GTA AGT ACC TCC ACC ACC ACC TCC ACC TTT ACC CGG
10 AGA CAG GGA GAG GCT CTT CTG C

15 which are SEQ ID NOS: 398 and 399, respectively. The oligonucleotides 1798-17 and 1798-18 contain an overlap of 61 nucleotides, allowing the two genes to be fused together in the correct reading frame by combining the above PCR products in a third reaction using the outside primers, 1216-52 and 1798-19.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated into the vector pAMG21 (described below), also digested with XbaI and BamHI. Ligated DNA was transformed into competent host cells of E. coli strain 2596 (GM221, described herein). Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3718.

25 The nucleotide and amino acid sequence of the resulting fusion protein (SEQ ID NOS: 15 and 16) are shown in Figure 13.

EMP-Fc. A DNA sequence coding for a monomer of the EPO-mimetic peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. Templates for PCR reactions were the pFC-A3a vector and a synthetic gene encoding EPO monomer.
30 The synthetic gene for the monomer was constructed from the 4 overlapping oligonucleotides 1798-4 and 1798-5 (above) and 1798-6 and 1798-7 (SEQ ID NOS: 400 and 401, respectively) shown below:

1798-6 GGC CCG CTG ACC TGG GTA TGT AAG CCA CAA GGG GGT GGG
GGA GGC GGG GGG TAA TCT CGA G

5 1798-7 GAT CCT CGA GAT TAC CCC CCG CCT CCC CCA CCC CCT TGT
GGC TTA CAT AC

The 4 oligonucleotides were annealed to form the duplex encoding an amino acid sequence (SEQ ID NOS: 402 and 403, respectively) shown below:

```

      GTTTGCAAACCGCAGGGTGGCGGCGGCGGCGGCGGTGGTACCTATTCCTGTCATTTTGGC
1  -----+-----+-----+-----+-----+-----+-----+ 60
      GTCCCAACCGCCGCCGCCGCCGCCACCATGGATAAGGACAGTAAACCG
15 A      V C K P Q G G G G G G G G T Y S C H F G -
      CCGCTGACCTGGGTATGTAAGCCACAAGGGGTGGGGGAGGCGGGGGTAATCTCGAG
61 -----+-----+-----+-----+-----+-----+ 122
      GGCGACTGGACCCATACATTCGGTGTTCCTCCACCCCTCCGCCCCCATTAGAGCTCCTAG
20 A      P L T W V C K P Q G G G G G G G G *

```

This duplex was amplified in a PCR reaction using

1798-21 TTA TTT CAT ATG AAA GGT GGT AAC TAT TCC TGT CAT TTT

25 and

1798-22 TGG ACA TGT GTG AGT TTT GTC CCC CCC GCC TCC CCC ACC
CCC T

30

as the sense and antisense primers (SEQ ID NOS: 404 and 405, respectively).

The Fc portion of the molecule was generated in a PCR reaction with pFc-A3 using the primers

1798-23 AGG GGG TGG GGG AGG CGG GGG GGA CAA AAC TCA CAC ATG
TCC A

35

and

1200-54 GTT ATT GCT CAG CGG TGG CA

40

which are SEQ ID NOS: 406 and 407, respectively. The oligonucleotides 1798-22 and 1798-23 contain an overlap of 43 nucleotides, allowing the two genes to be fused together in the correct reading frame by combining the above PCR products in a third reaction using the outside primers, 1787-21 and 1200-54.

45

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated

into the vector pAMG21 and transformed into competent *E. coli* strain 2596 cells as described above. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3688.

The nucleotide and amino acid sequences (SEQ ID NOS: 17 and 18) of the resulting fusion protein are shown in Figure 14.

EMP-EMP-Fc. A DNA sequence coding for a dimer of the EPO-mimetic peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. Templates for PCR reactions were the EMP-Fc plasmid from strain #3688 above and a synthetic gene encoding the EPO dimer. The synthetic gene for the dimer was constructed from the 8 overlapping oligonucleotides (SEQ ID NOS:408 to 415, respectively) shown below:

15	1869-23	TTT TTT ATC GAT TTG ATT CTA GAT TTG AGT TTT AAC TTT TAG AAG GAG GAA TAA AAT ATG
20	1869-48	TAA AAG TTA AAA CTC AAA TCT AGA ATC AAA TCG ATA AAA AA
	1871-72	GGA GGT ACT TAC TCT TGC CAC TTC GGC CCG CTG ACT TGG GTT TGC AAA CCG
25	1871-73	AGT CAG CGG GCC GAA GTG GCA AGA GTA AGT ACC TCC CAT ATT TTA TTC CTC CTT C
	1871-74	CAG GGT GGC GGC GGC GGC GGC GGT GGT ACC TAT TCC TGT CAT TTT GGC CCG CTG ACC TGG
30	1871-75	AAA ATG ACA GGA ATA GGT ACC ACC GCC GCC GCC GCC GCC ACC CTG CGG TTT GCA AAC CCA
35	1871-78	GTA TGT AAG CCA CAA GGG GGT GGG GGA GGC GGG GGG GAC AAA ACT CAC ACA TGT CCA
	1871-79	AGT TTT GTC CCC CCC GCC TCC CCC ACC CCC TTG TGG CTT ACA TAC CCA GGT CAG CGG GCC

The 8 oligonucleotides were annealed to form the duplex encoding an amino acid sequence (SEQ ID NOS: 416 and 417, respectively) shown below:

45	1	TTTTTTATCGATTTGATTCTAGATTTGAGTTTAACTTTTAGAAGGAGGAATAAAATATG -----+-----+-----+-----+-----+-----+-----+-----+ 60 AAAAAATAGCTAAACTAAGATCTAAACTCAAATTGAAAATCTTCCTCCTTATTTATAC a M
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      GGAGGTACTTACTCTTGCCACTTCGGCCCCGCTGACTTGGGTTTGCAAACCGCAGGGTGGC
61  -----+-----+-----+-----+-----+-----+-----+-----+ 120
5   a  CCTCCATGAATGAGAACGGTGAAGCCGGGCGACTGAACCCAAACGTTTGGCGTCCCACCG
      G G T Y S C H F G P L T W V C K P Q G G -
      GGCGGCGGCGGCGGTGGTACCTATTCCTGTCAATTTGGCCCCGCTGACCTGGGTATGTAAG
121 -----+-----+-----+-----+-----+-----+-----+-----+ 180
10  a  CCGCCGCCGCCGCCACCATGGATAAGGACAGTAAAACCGGGCGACTGGACCCATACATTC
      G G G G G G T Y S C H F G P L T W V C K -
      CCACAAGGGGGTGGGGGAGGCGGGGGGACAAAACCTCACACATGTCCA
181 -----+-----+-----+-----+-----+-----+-----+-----+ 228
15  a  GGTGTTCCCCCACCCCTCCGCCCCCTGTTTGA
      P Q G G G G G G G D K T H T C P -

```

This duplex was amplified in a PCR reaction using 1869-23 and 1871-79 (shown above) as the sense and antisense primers.

The Fc portion of the molecule was generated in a PCR reaction with strain 3688 DNA using the primers 1798-23 and 1200-54 (shown above).

The oligonucleotides 1871-79 and 1798-23 contain an overlap of 31 nucleotides, allowing the two genes to be fused together in the correct reading frame by combining the above PCR products in a third reaction using the outside primers, 1869-23 and 1200-54.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for Fc-EMP. Clones were screened for ability to produce the recombinant protein product and possession of the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3813.

The nucleotide and amino acid sequences (SEQ ID NOS: 19 and 20, respectively) of the resulting fusion protein are shown in Figure 15. There is a silent mutation at position 145 (A to G, shown in boldface) such that the final construct has a different nucleotide sequence than the oligonucleotide 1871-72 from which it was derived.

Fc-EMP-EMP. A DNA sequence coding for the Fc region of human IgG1 fused in-frame to a dimer of the EPO-mimetic peptide was

constructed using standard PCR technology. Templates for PCR reactions were the plasmids from strains 3688 and 3813 above.

The Fc portion of the molecule was generated in a PCR reaction with strain 3688 DNA using the primers 1216-52 and 1798-17 (shown above). The EMP dimer portion of the molecule was the product of a second PCR reaction with strain 3813 DNA using the primers 1798-18 (also shown above) and SEQ ID NO: 418, shown below:

1798-20 CTA ATT GGA TCC TCG AGA TTA ACC CCC TTG TGG CTT ACAT

The oligonucleotides 1798-17 and 1798-18 contain an overlap of 61 nucleotides, allowing the two genes to be fused together in the correct reading frame by combining the above PCR products in a third reaction using the outside primers, 1216-52 and 1798-20.

The final PCR gene product (the full length fusion gene) was digested with restriction endonucleases XbaI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for Fc-EMP. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #3822.

The nucleotide and amino acid sequences (SEQ ID NOS: __ and __, respectively) of the fusion protein are shown in Figure 16.

Characterization of Fc-EMP activity. Characterization was carried out in vivo as follows.

Mice: Normal female BDF1 approximately 10-12 weeks of age.

Bleed schedule: Ten mice per group treated on day 0, two groups started 4 days apart for a total of 20 mice per group. Five mice bled at each time point, mice were bled a maximum of three times a week. Mice were anesthetized with isoflurane and a total volume of 140-160 ml of blood was obtained by puncture of the orbital sinus. Blood was counted

on a Technicon H1E blood analyzer running software for murine blood. Parameters measured were WBC, RBC, HCT, HGB, PLT, NEUT, LYMPH.

Treatments: Mice were either injected subcutaneously for a bolus treatment or implanted with 7 day micro-osmotic pumps for continuous delivery. Subcutaneous injections were delivered in a volume of 0.2 ml. Osmotic pumps were inserted into a subcutaneous incision made in the skin between the scapulae of anesthetized mice. Compounds were diluted in PBS with 0.1% BSA. All experiments included one control group, labeled "carrier" that were treated with this diluent only. The concentration of the test articles in the pumps was adjusted so that the calibrated flow rate from the pumps gave the treatment levels indicated in the graphs.

Experiments: Various Fc-conjugated EPO mimetic peptides (EMPs) were delivered to mice as a single bolus injection at a dose of 100 µg/kg. Fc-EMPs were delivered to mice in 7-day micro-osmotic pumps. The pumps were not replaced at the end of 7 days. Mice were bled until day 51 when HGB and HCT returned to baseline levels.

Example 4

TNF- α inhibitors

Fc-TNF- α inhibitors. A DNA sequence coding for the Fc region of human IgG1 fused in-frame to a monomer of the TNF- α inhibitory peptide was constructed using standard PCR technology. The Fc and 5 glycine linker portion of the molecule was generated in a PCR reaction with DNA from the Fc-EMP fusion strain #3718 (see Example 3) using the sense primer 1216-52 and the antisense primer 2295-89 (SEQ ID NOS: 1112 and 1113, respectively). The nucleotides encoding the TNF- α inhibitory peptide were provided by the PCR primer 2295-89 shown below:

30	1216-52	AAC ATA AGT ACC TGT AGG ATC G
	2295-89	CCG CGG ATC CAT TAC GGA CGG TGA CCC AGA GAG GTG TTT TTG TAG

TGC GGC AGG AAG TCA CCA CCA CCT CCA CCT TTA CCC

The oligonucleotide 2295-89 overlaps the glycine linker and Fc portion of the template by 22 nucleotides, with the PCR resulting in the two genes
5 being fused together in the correct reading frame.

The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to
10 produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4544.

The nucleotide and amino acid sequences (SEQ ID NOS: 1055 and 1056) of the fusion protein are shown in Figures 19A and 19B.

15 TNF- α inhibitor-Fc. A DNA sequence coding for a TNF- α inhibitory peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. The template for the PCR reaction was a plasmid containing an unrelated peptide fused via a five glycine linker to Fc. The nucleotides encoding the TNF- α inhibitory peptide were
20 provided by the sense PCR primer 2295-88, with primer 1200-54 serving as the antisense primer (SEQ ID NOS: 1117 and 407, respectively). The primer sequences are shown below:

25 2295-88 GAA TAA CAT ATG GAC TTC CTG CCG CAC TAC AAA AAC ACC TCT CTG GGT
CAC CGT CCG GGT GGA GGC GGT GGG GAC AAA ACT

30 1200-54 GTT ATT GCT CAG CGG TGG CA

The oligonucleotide 2295-88 overlaps the glycine linker and Fc portion of the template by 24 nucleotides, with the PCR resulting in the two genes being fused together in the correct reading frame.

The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to
5 produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4543.

The nucleotide and amino acid sequences (SEQ ID NOS: 1057 and 1058) of the fusion protein are shown in Figures 20A and 20B.

10 Expression in E. coli. Cultures of each of the pAMG21-Fc-fusion constructs in E. coli GM221 were grown at 37 °C in Luria Broth medium containing 50 mg/ml kanamycin. Induction of gene product expression from the luxPR promoter was achieved following the addition of the synthetic autoinducer N-(3-oxohexanoyl)-DL-homoserine lactone to the
15 culture media to a final concentration of 20 ng/ml. Cultures were incubated at 37 °C for a further 3 hours. After 3 hours, the bacterial cultures were examined by microscopy for the presence of inclusion bodies and were then collected by centrifugation. Refractile inclusion bodies were observed in induced cultures indicating that the Fc-fusions
20 were most likely produced in the insoluble fraction in E. coli. Cell pellets were lysed directly by resuspension in Laemmli sample buffer containing 10% β -mercaptoethanol and were analyzed by SDS-PAGE. In each case, an intense coomassie-stained band of the appropriate molecular weight was observed on an SDS-PAGE gel.

25 Purification of Fc-peptide fusion proteins. Cells are broken in water (1/10) by high pressure homogenization (2 passes at 14,000 PSI) and inclusion bodies are harvested by centrifugation (4200 RPM in J-6B for 1 hour). Inclusion bodies are solubilized in 6M guanidine, 50mM Tris, 8mM DTT, pH 8.7 for 1 hour at a 1/10 ratio. The solubilized mixture is diluted

20 times into 2M urea, 50 mM tris, 160mM arginine, 3mM cysteine, pH 8.5. The mixture is stirred overnight in the cold and then concentrated about 10 fold by ultrafiltration. It is then diluted 3 fold with 10mM Tris, 1.5M urea, pH 9. The pH of this mixture is then adjusted to pH 5 with acetic acid. The precipitate is removed by centrifugation and the supernatant is loaded onto a SP-Sepharose Fast Flow column equilibrated in 20mM NaAc, 100 mM NaCl, pH 5 (10mg/ml protein load, room temperature). The protein is eluted from the column using a 20 column volume gradient in the same buffer ranging from 100mM NaCl to 500mM NaCl. The pool from the column is diluted 3 fold and loaded onto a SP-Sepharose HP column in 20mM NaAc, 150mM NaCl, pH 5 (10mg/ml protein load, room temperature). The protein is eluted using a 20 column volume gradient in the same buffer ranging from 150mM NaCl to 400mM NaCl. The peak is pooled and filtered.

Characterization of activity of Fc-TNF- α inhibitor and TNF- α inhibitor -Fc. Binding of these peptide fusion proteins to TNF- α can be characterized by BIAcore by methods available to one of ordinary skill in the art who is armed with the teachings of the present specification.

Example 5

IL-1 Antagonists

Fc-IL-1 antagonist. A DNA sequence coding for the Fc region of human IgG1 fused in-frame to a monomer of an IL-1 antagonist peptide was constructed using standard PCR technology. The Fc and 5 glycine linker portion of the molecule was generated in a PCR reaction with DNA from the Fc-EMP fusion strain #3718 (see Example 3) using the sense primer 1216-52 and the antisense primer 2269-70 (SEQ ID NOS: 1112 and 1118, respectively). The nucleotides encoding the IL-1 antagonist peptide were provided by the PCR primer 2269-70 shown below:

1216-52 AAC ATA AGT ACC TGT AGG ATC G
 2269-70 CCG CGG ATC CAT TAC AGC GGC AGA GCG TAC GGC TGC CAG TAA CCC
 GGG GTC CAT TCG AAA CCA CCA CCT CCA CCT TTA CCC

5

The oligonucleotide 2269-70 overlaps the glycine linker and Fc portion of the template by 22 nucleotides, with the PCR resulting in the two genes being fused together in the correct reading frame.

10 The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion
 15 having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4506.

The nucleotide and amino acid sequences (SEQ ID NOS: 1059 and 1060) of the fusion protein are shown in Figures 21A and 21B.

IL-1 antagonist-Fc. A DNA sequence coding for an IL-1 antagonist
 20 peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. The template for the PCR reaction was a plasmid containing an unrelated peptide fused via a five glycine linker to Fc. The nucleotides encoding the IL-1 antagonist peptide were provided by the sense PCR primer 2269-69, with primer 1200-54 serving as the
 25 antisense primer (SEQ ID NOS: 1119 and 407, respectively). The primer sequences are shown below:

30 2269-69 GAA TAA CAT ATG TTC GAA TGG ACC CCG GGT TAC TGG CAG CCG TAC GCT
 CTG CCG CTG GGT GGA GGC GGT GGG GAC AAA ACT
 1200-54 GTT ATT GCT CAG CGG TGG CA

The oligonucleotide 2269-69 overlaps the glycine linker and Fc portion of the template by 24 nucleotides, with the PCR resulting in the two genes being fused together in the correct reading frame.

5 The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion
10 having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4505.

The nucleotide and amino acid sequences (SEQ ID NOS: 1061 and 1062) of the fusion protein are shown in Figures 22A and 22B. Expression and purification were carried out as in previous examples.

15 Characterization of Fc-IL-1 antagonist peptide and IL-1 antagonist peptide-Fc activity. IL-1 Receptor Binding competition between IL-1 β , IL-1RA and Fc-conjugated IL-1 peptide sequences was carried out using the IGEN system. Reactions contained 0.4 nM biotin-IL-1R + 15 nM IL-1-TAG + 3 uM competitor + 20 ug/ml streptavidin-conjugate beads, where
20 competitors were IL-1RA, Fc-IL-1 antagonist, IL-1 antagonist-Fc). Competition was assayed over a range of competitor concentrations from 3 uM to 1.5 pM. The results are shown in Table C below:

Table C—Results from IL-1 Receptor Binding Competition Assay

		<i>IL-1pep-Fc</i>	<i>Fc-IL-1pep</i>	<i>IL-1ra</i>
5	KI	281.5	59.58	1.405
	EC50	530.0	112.2	2.645
	95% Confidence Intervals			
10	EC50	280.2 to 1002	54.75 to 229.8	1.149 to 6.086
	KI	148.9 to 532.5	29.08 to 122.1	0.6106 to 3.233
15	Goodness of Fit			
	R²	0.9790	0.9687	0.9602

2293-03 ATT TGA TTC TAG AAG GAG GAA TAA CAT ATG GAC AAA ACT CAC
ACA TGT

5 2293-04 GTC ACA GTT CGG TTC AAC ACC ACC ACC ACC ACC TTT ACC CGG
AGA CAG GGA

2293-05 TCC CTG TCT CCG GGT AAA GGT GGT GGT GGT GGT GTT GAA CCG
AAC TGT GAC ATC

10 2293-06 CCG CGG ATC CTC GAG TTA CAG ACG TTC AAA ACA TTC CCA

The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4523.

20 The nucleotide and amino acid sequences (SEQ ID NOS: 1063 and 1064) of the fusion protein are shown in Figures 23A and 23B.

VEGF antagonist -Fc. A DNA sequence coding for a VEGF mimetic peptide fused in-frame to the Fc region of human IgG1 was constructed using standard PCR technology. The templates for the PCR reaction were the pFc-A3 plasmid and the synthetic VEGF mimetic peptide gene described above. The synthetic duplex was amplified in a PCR reaction using 2293-07 and 2293-08 as the sense and antisense primers (SEQ ID NOS. 1127 and 1128, respectively).

30 The Fc portion of the molecule was generated in a PCR reaction with the pFc-A3 plasmid using the primers 2293-09 and 2293-10 as the sense and antisense primers (SEQ ID NOS. 1129 and 1130, respectively).

The full length fusion gene was obtained from a third PCR reaction using the outside primers 2293-07 and 2293-10. These primers are shown below:

2293-07 ATT TGA TTC TAG AAG GAG GAA TAA CAT ATG GTT GAA CCG AAC
5 TGT GAC

2293-08 ACA TGT GTG AGT TTT GTC ACC ACC ACC ACC ACC CAG ACG TTC
 AAA ACA TTC

10 2293-09 GAA TGT TTT GAA CGT CTG GGT GGT GGT GGT GGT GAC AAA ACT
 CAC ACA TGT

2293-10 CCG CGG ATC CTC GAG TTA TTT ACC CGG AGA CAG GGA GAG

15 The PCR gene product (the full length fusion gene) was digested
with restriction endonucleases NdeI and BamHI, and then ligated into the
vector pAMG21 and transformed into competent E. coli strain 2596 cells as
described for EMP-Fc herein. Clones were screened for the ability to
produce the recombinant protein product and to possess the gene fusion
having the correct nucleotide sequence. A single such clone was selected
20 and designated Amgen strain #4524.

The nucleotide and amino acid sequences (SEQ ID NOS: 1065 and
1066) of the fusion protein are shown in Figures 24A and 24B. Expression
and purification were carried out as in previous examples.

25

Example 7

MMP Inhibitors

Fc-MMP inhibitor. A DNA sequence coding for the Fc region of
human IgG1 fused in-frame to a monomer of an MMP inhibitory peptide
was constructed using standard PCR technology. The Fc and 5 glycine
30 linker portion of the molecule was generated in a PCR reaction with DNA
from the Fc-TNF- α inhibitor fusion strain #4544 (see Example 4) using the
sense primer 1216-52 and the antisense primer 2308-67 (SEQ ID NOS: 1112

5

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The oligonucleotide 2269-69 overlaps the glycine linker and Fc portion of the template by 24 nucleotides, with the PCR resulting in the two genes being fused together in the correct reading frame.

5 The PCR gene product (the full length fusion gene) was digested with restriction endonucleases NdeI and BamHI, and then ligated into the vector pAMG21 and transformed into competent E. coli strain 2596 cells as described for EMP-Fc herein. Clones were screened for the ability to produce the recombinant protein product and to possess the gene fusion
10 having the correct nucleotide sequence. A single such clone was selected and designated Amgen strain #4598.

The nucleotide and amino acid sequences (SEQ ID NOS: 1069 and 1070) of the fusion protein are shown in Figures 26A and 26B.

* * *

15 The invention now being fully described, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto, without departing from the spirit and scope of the invention as set forth herein.

20 **Abbreviations**

Abbreviations used throughout this specification are as defined below, unless otherwise defined in specific circumstances.

Ac	acetyl (used to refer to acetylated residues)
AcBpa	acetylated p-benzoyl-L-phenylalanine
ADCC	antibody-dependent cellular cytotoxicity
Aib	aminoisobutyric acid
bA	beta-alanine
Bpa	p-benzoyl-L-phenylalanine
BrAc	bromoacetyl ($\text{BrCH}_2\text{C}(\text{O})$)

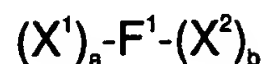
	BSA	Bovine serum albumin
	Bzl	Benzyl
	Cap	Caproic acid
	CTL	Cytotoxic T lymphocytes
5	CTLA4	Cytotoxic T lymphocyte antigen 4
	DARC	Duffy blood group antigen receptor
	DCC	Dicyclohexylcarbodiimide
	Dde	1-(4,4-dimethyl-2,6-dioxo-cyclohexylidene)ethyl
	EMP	Erythropoietin-mimetic peptide
10	ESI-MS	Electron spray ionization mass spectrometry
	EPO	Erythropoietin
	Fmoc	fluorenylmethoxycarbonyl
	G-CSF	Granulocyte colony stimulating factor
	GH	Growth hormone
15	HCT	hematocrit
	HGB	hemoglobin
	hGH	Human growth hormone
	HOBt	1-Hydroxybenzotriazole
	HPLC	high performance liquid chromatography
20	IL	interleukin
	IL-R	interleukin receptor
	IL-1R	interleukin-1 receptor
	IL-1ra	interleukin-1 receptor antagonist
	Lau	Lauric acid
25	LPS	lipopolysaccharide
	LYMPH	lymphocytes
	MALDI-MS	Matrix-assisted laser desorption ionization mass spectrometry
	Me	methyl

	MeO	methoxy
	MHC	major histocompatibility complex
	MMP	matrix metalloproteinase
	MMPI	matrix metalloproteinase inhibitor
5	1-Nap	1-naphthylalanine
	NEUT	neutrophils
	NGF	nerve growth factor
	Nle	norleucine
	NMP	N-methyl-2-pyrrolidinone
10	PAGE	polyacrylamide gel electrophoresis
	PBS	Phosphate-buffered saline
	Pbf	2,2,4,6,7-pendamethyldihydrobenzofuran-5-sulfonyl
	PCR	polymerase chain reaction
	Pec	pipecolic acid
15	PEG	Poly(ethylene glycol)
	pGlu	pyroglutamic acid
	Pic	picolinic acid
	PLT	platelets
	pY	phosphotyrosine
20	RBC	red blood cells
	RBS	ribosome binding site
	RT	room temperature (25 °C)
	Sar	sarcosine
	SDS	sodium dodecyl sulfate
25	STK	serine-threonine kinases
	t-Boc	tert-Butoxycarbonyl
	tBu	tert-Butyl
	TGF	tissue growth factor
	THF	thymic humoral factor

	TK	tyrosine kinase
	TMP	Thrombopoietin-mimetic peptide
	TNF	Tissue necrosis factor
	TPO	Thrombopoietin
5	TRAIL	TNF-related apoptosis-inducing ligand
	Trt	trityl
	UK	urokinase
	UKR	urokinase receptor
	VEGF	vascular endothelial cell growth factor
10	VIP	vasoactive intestinal peptide
	WBC	white blood cells

What is claimed is:

1. A composition of matter of the formula



and multimers thereof, wherein:

- 5 F^1 is an Fc domain;

X^1 and X^2 are each independently selected from $-(L^1)_c-P^1$, $-(L^1)_c-P^1-(L^2)_d-P^2$, $-(L^1)_c-P^1-(L^2)_d-P^2-(L^3)_e-P^3$, and $-(L^1)_c-P^1-(L^2)_d-P^2-(L^3)_e-P^3-(L^4)_f-P^4$

- 10 P^1 , P^2 , P^3 , and P^4 are each independently sequences of pharmacologically active peptides;

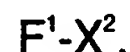
L^1 , L^2 , L^3 , and L^4 are each independently linkers; and

a , b , c , d , e , and f are each independently 0 or 1, provided that at least one of a and b is 1.

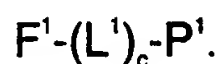
2. The composition of matter of Claim 1 of the formulae



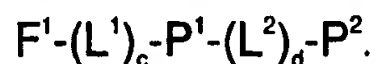
or



3. The composition of matter of Claim 1 of the formula



- 20 4. The composition of matter of Claim 1 of the formula



5. The composition of matter of Claim 1 wherein F^1 is an IgG Fc domain.

- 25 6. The composition of matter of Claim 1 wherein F^1 is an IgG1 Fc domain.

7. The composition of matter of Claim 1 wherein F^1 comprises the sequence of SEQ ID NO: 2.

8. The composition of matter of Claim 1 wherein X^1 and X^2 comprise an IL-1 antagonist peptide sequence.

9. The composition of matter of Claim 8 wherein the IL-1 antagonist peptide sequence is selected from SEQ ID NOS: 212, 907, 908, 909, 910, 917, and 979.
10. The composition of matter of Claim 8 wherein the IL-1 antagonist peptide sequence is selected from SEQ ID NOS: 213 to 271, 671 to 906, 911 to 916, and 918 to 1023.
11. The composition of matter of Claim 8 wherein F¹ comprises the sequence of SEQ ID NO: 2.
12. The composition of matter of Claim 1 wherein X¹ and X² comprise an EPO-mimetic peptide sequence.
13. The composition of matter of Claim 12 wherein the EPO-mimetic peptide sequence is selected from Table 5.
14. The composition of matter of Claim 12 wherein F¹ comprises the sequence of SEQ ID NO: 2.
15. The composition of matter of Claim 12 comprising a sequence selected from SEQ ID NOS: 83, 84, 85, 124, 419, 420, 421, and 461.
16. The composition of matter of claim 12 comprising a sequence selected from SEQ ID NOS: 339 and 340.
17. The composition of matter of Claim 12 comprising a sequence selected from SEQ ID NOS: 20 and 22.
18. The composition of matter of Claim 3 wherein P¹ is a TPO-mimetic peptide sequence.
19. The composition of matter of Claim 18 wherein P¹ is a TPO-mimetic peptide sequence selected from Table 6.
20. The composition of matter of Claim 18 wherein F¹ comprises the sequence of SEQ ID NO: 2.
21. The composition of matter of Claim 18 having a sequence selected from SEQ ID NOS: 6 and 12.
22. A DNA encoding a composition of matter of any of Claims 1 to 21.

23. An expression vector comprising the DNA of Claim 22.
24. A host cell comprising the expression vector of Claim 23.
25. The cell of Claim 24, wherein the cell is an E. coli cell.
26. A process for preparing a pharmacologically active compound,
5 which comprises
- a) selecting at least one randomized peptide that modulates the activity of a protein of interest; and
- b) preparing a pharmacologic agent comprising at least one Fc domain covalently linked to at least one amino acid sequence
10 of the selected peptide or peptides.
27. The process of Claim 26, wherein the peptide is selected in a process comprising screening of a phage display library, an E. coli display library, a ribosomal library, or a chemical peptide library.
28. The process of Claim 26, wherein the preparation of the
15 pharmacologic agent is carried out by:
- a) preparing a gene construct comprising a nucleic acid sequence encoding the selected peptide and a nucleic acid sequence encoding an Fc domain; and
- b) expressing the gene construct.
- 20 29. The process of Claim 26, wherein the gene construct is expressed in an E. coli cell.
30. The process of Claim 26, wherein the protein of interest is a cell surface receptor.
31. The process of Claim 26, wherein the protein of interest has a linear
25 epitope.
32. The process of Claim 26, wherein the protein of interest is a cytokine receptor.
33. The process of Claim 26, wherein the peptide is an EPO-mimetic peptide.

34. The process of Claim 26, wherein the peptide is a TPO-mimetic peptide.
35. The process of Claim 26, wherein the peptide is an IL-1 antagonist peptide.
- 5 36. The process of Claim 26, wherein the peptide is an MMP inhibitor peptide or a VEGF antagonist peptide.
37. The process of Claim 26, wherein the peptide is a TNF-antagonist peptide.
38. The process of Claim 26, wherein the peptide is a CTLA4-mimetic peptide.
- 10 39. The process of Claim 26, wherein the peptide is selected from Tables 4 to 20.
40. The process of Claim 26, wherein the selection of the peptide is carried out by a process comprising:
- 15 a) preparing a gene construct comprising a nucleic acid sequence encoding a first selected peptide and a nucleic acid sequence encoding an Fc domain;
- b) conducting a polymerase chain reaction using the gene construct and mutagenic primers, wherein
- 20 i) a first mutagenic primer comprises a nucleic acid sequence complementary to a sequence at or near the 5' end of a coding strand of the gene construct, and
- ii) a second mutagenic primer comprises a nucleic acid sequence complementary to the 3' end of the
- 25 noncoding strand of the gene construct.
41. The process of Claim 26, wherein the compound is derivatized.
42. The process of Claim 26, wherein the derivatized compound comprises a cyclic portion, a cross-linking site, a non-peptidyl

linkage, an N-terminal replacement, a C-terminal replacement, or a modified amino acid moiety.

43. The process of Claim 26 wherein the Fc domain is an IgG Fc domain.

5 44. The process of Claim 26, wherein the vehicle is an IgG1 Fc domain.

45. The process of Claim 26, wherein the vehicle comprises the sequence of SEQ ID NO: 2.

46. The process of Claim 26, wherein the compound prepared is of the formula



and multimers thereof, wherein:

F¹ is an Fc domain;

X¹ and X² are each independently selected from -(L¹)_c-P¹, -(L¹)_c-P¹-(L²)_d-P², -(L¹)_c-P¹-(L²)_d-P²-(L³)_e-P³, and -(L¹)_c-P¹-(L²)_d-P²-(L³)_e-P³-(L⁴)_f-P⁴

15

P¹, P², P³, and P⁴ are each independently sequences of pharmacologically active peptides;

L¹, L², L³, and L⁴ are each independently linkers; and

a, b, c, d, e, and f are each independently 0 or 1, provided

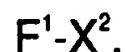
20 that at least one of a and b is 1.

47. The process of Claim 46, wherein the compound prepared is of the formulae

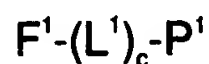


or

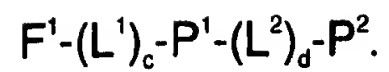
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48. The process of Claim 46, wherein the compound prepared is of the formulae



or



49. The process of Claim 46, wherein F^1 is an IgG Fc domain.
50. The process of Claim 46, wherein F^1 is an IgG1 Fc domain.
- 5 51. The process of Claim 46, wherein F^1 comprises the sequence of SEQ
ID NO: 2.

FIG. 1

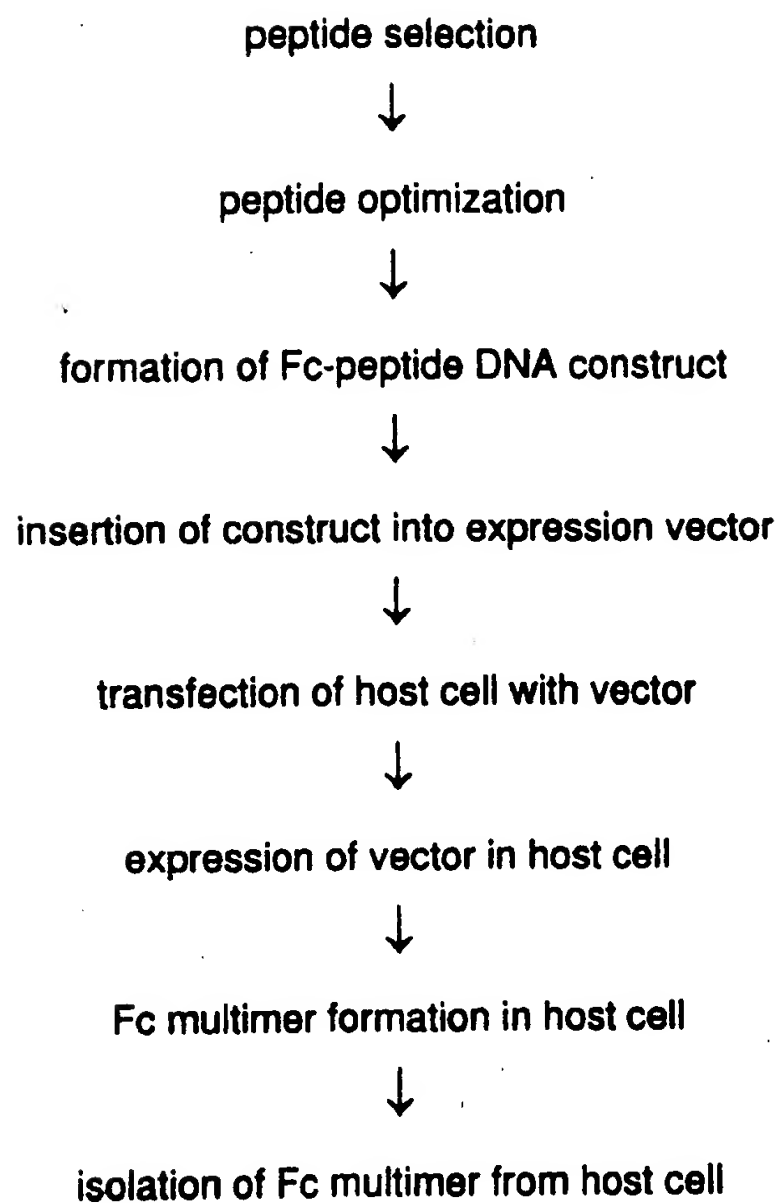


FIG. 2A

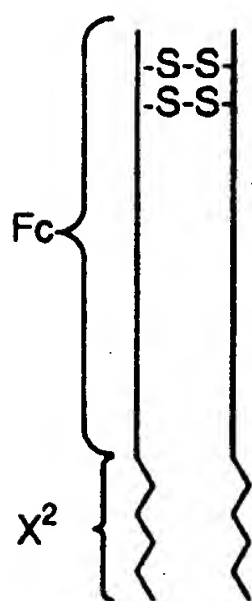


FIG. 2B

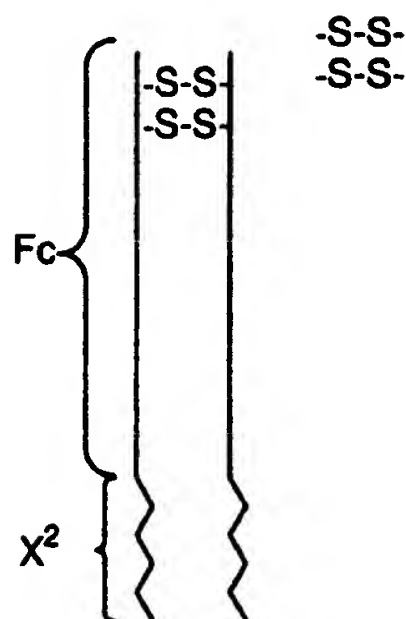


FIG. 2C

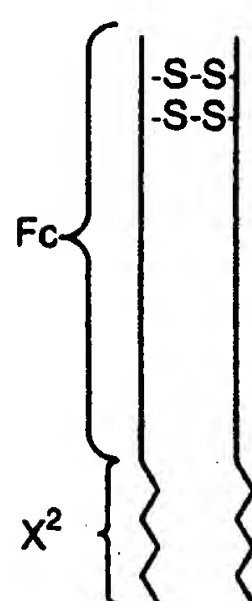


FIG. 2D

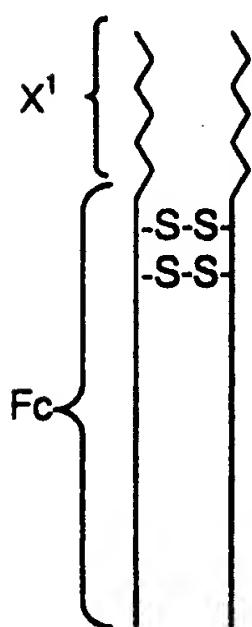


FIG. 2E

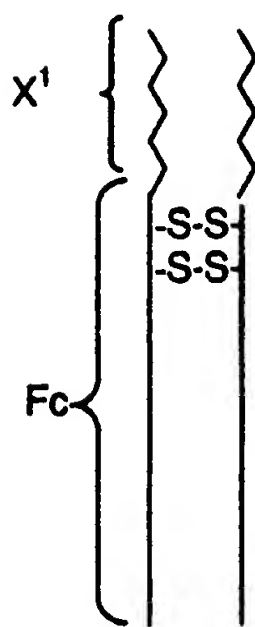


FIG. 2F

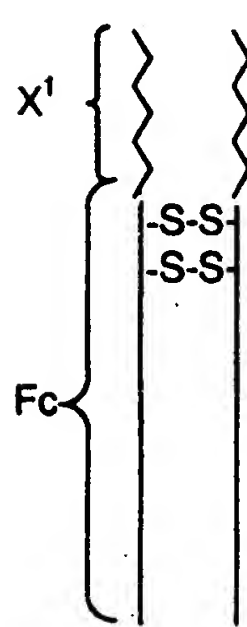


FIG. 3A

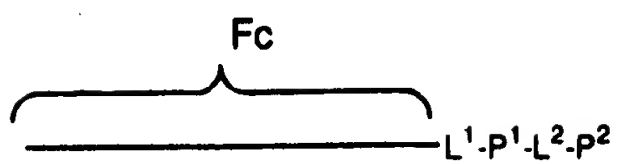


FIG. 3B

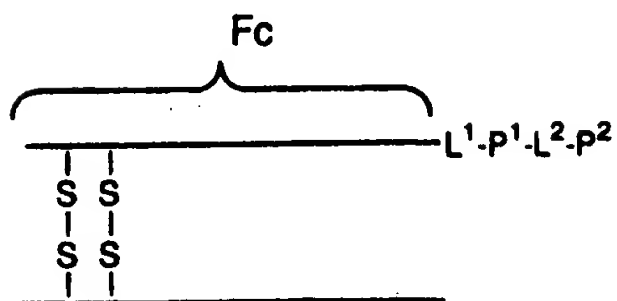


FIG. 3C

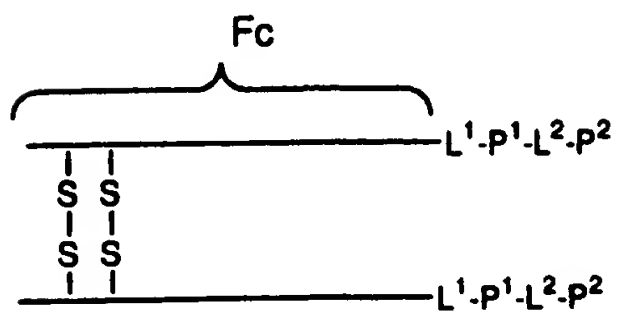


FIG. 4

ATGGACAAACTCACACATGTCCACCTTGTCCAGCTCCGGAACCTCCTGGGGGGACCGTCA
1+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 60
TACCTGTTTTGAGTGTGTACAGGTGGAACAGGTCGAGGCCTTGAGGACCCCCCTGGCAGT

a M D K T H T C P P C P A P E L L G G P S -

GTCTTCCTCTTCCCCCAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTC
61+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 120
CAGAAGGAGAAGGGGGGTTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGGACTCCAG

a V F L F P P K P K D T L M I S R T P E V -

ACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTG
121+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 180
TGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATGCAC

a T C V V V D V S H E D P E V K F N W Y V -

GACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACG
181+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 240
CTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTCGTGC

a D G V E V H N A K T K P R E E Q Y N S T -

TACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTAC
241+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 300
ATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCGTTCCTCATG

a Y R V V S V L T V L H Q D W L N G K E Y -

AAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAGCC
301+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 360
TTCACGTTCCAGAGGTTGTTTCGGGAGGGTCGGGGGTAGCTCTTTTGGTAGAGGTTTCGG

a K C K V S N K A L P A P I E K T I S K A -

AAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTGACC
361+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 420
TTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGACTGG

a K G Q P R E P Q V Y T L P P S R D E L T -

AAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTG
421+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 480
TTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGGCAC

a K N Q V S L T C L V K G F Y P S D I A V -

GAGTGGGAGAGCAATGGGCAGCCGGAGAACAATAAGACCACGCCTCCCGTGCTGGAC
481+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 540
CTCACCTCTCGTTACCCGTCGGCCTCTTGTGATGTTCTGGTGCGGAGGGCACGACCTG

a E W E S N G Q P E N N Y K T T P P V L D -

TCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAG
541+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 600
AGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTCGTC

a S D G S F F L Y S K L T V D K S R W Q Q -

GGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAG
601+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 660
CCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTCTTC

a G N V F S C S V M H E A L H N H Y T Q K -

AGCCTCTCCCTGTCTCCGGGTAAA
661+.....+.....+.....+.....+.....+.....+.....+.....+.....+ 684
TCGGAGAGGGACAGAGGCCCATTT

FIG. 5

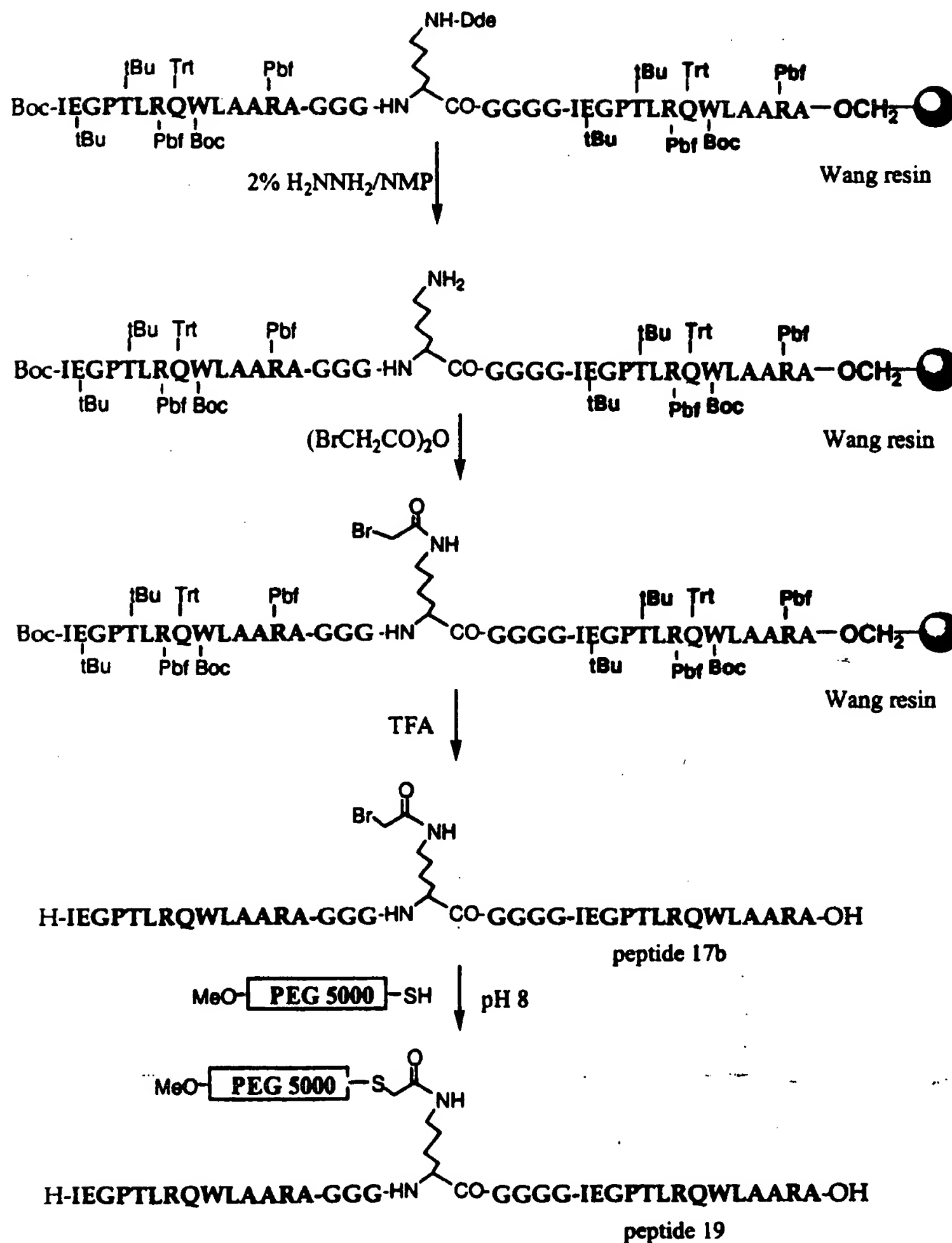


FIG. 6

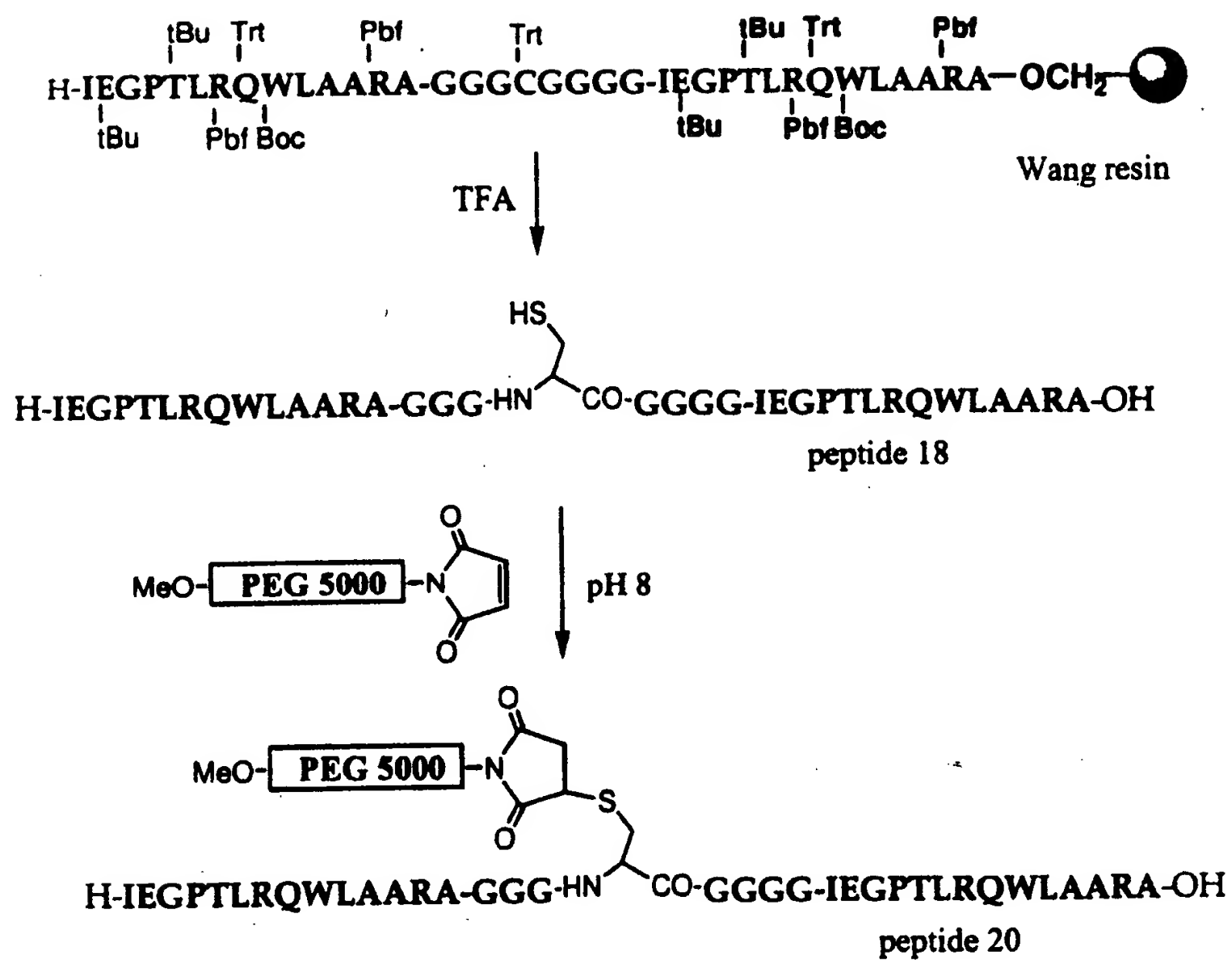


FIG. 7

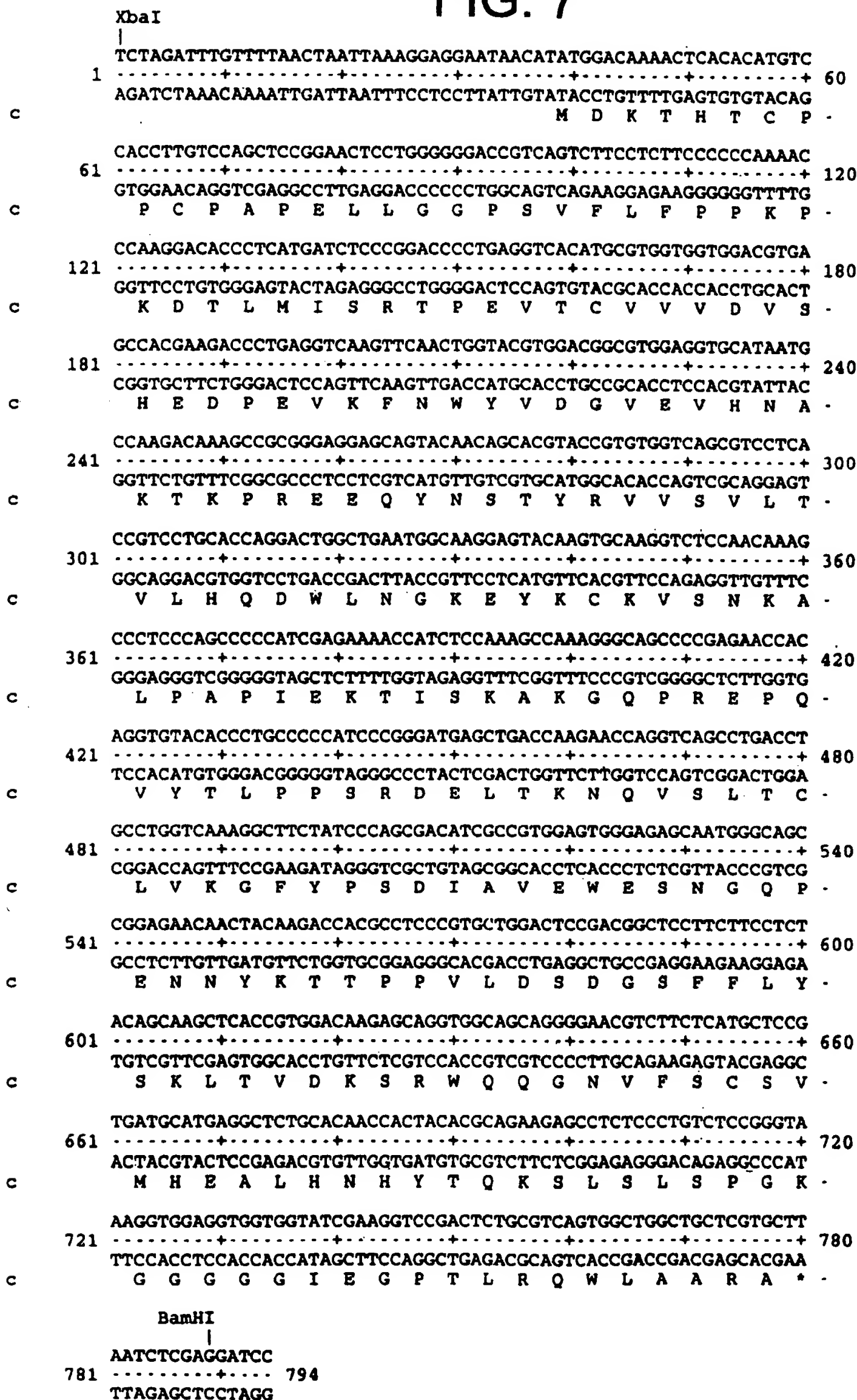
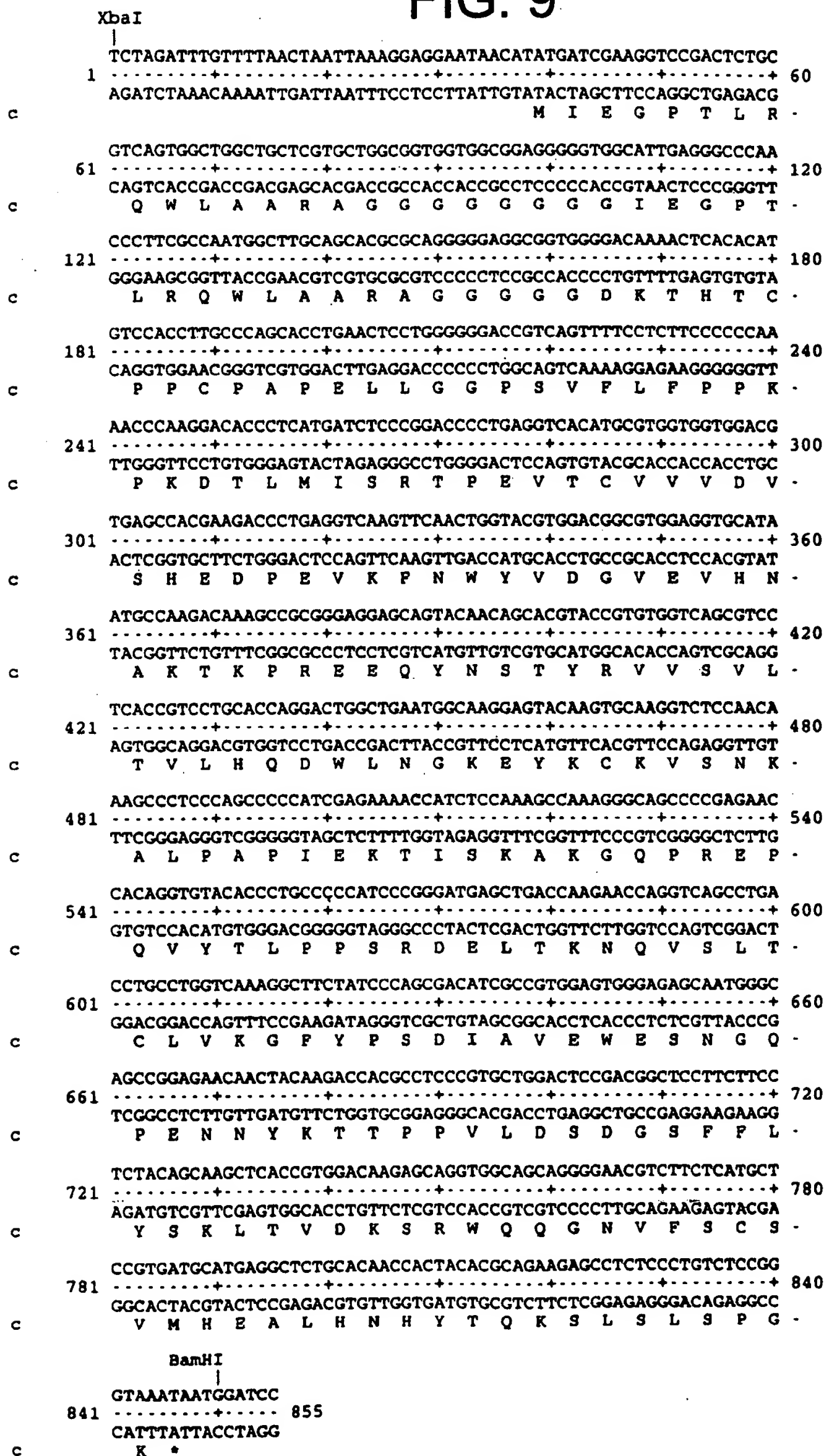


FIG. 8

XbaI
|
1 TCTAGATTGTTTTAACTAATTAAGGAGGAATAACATATGGACAAAACCTCACACATGTC 60
.....+.....+.....+.....+.....+.....+.....+.....+.....+
AGATCTAAACAAAATTGATTAATTTCTCCTTATTGTATACCTGTTTGTAGTGTGTACAG
M D K T H T C P
CACCTTGTCCAGCTCCGGAACCTCTGGGGGACCGTCAGTCTTCCTCTTCCCCCAAAC
61+.....+.....+.....+.....+.....+.....+.....+.....+ 120
GTGGAACAGGTCGAGGCCCTTGAGGACCCCCCTGGCAGTCAGAAGGAGAAGGGGGGTTTGT
P C P A P E L L G G P S V F L F P P K P
CCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTACATGCGTGGTGGTGGACGTGA
121+.....+.....+.....+.....+.....+.....+.....+.....+ 180
GGTTCCTGTGGGAGTACTAGAGGCCCTGGGGACTCCAGTGTACGCACCACCACCTGCCT
K D T L M I S R T P E V T C V V V D V S
GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATG
181+.....+.....+.....+.....+.....+.....+.....+.....+ 240
CGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATGCACCTGCCGCACCTCCACGTATTAC
H E D P E V K F N W Y V D G V E V H N A
CCAAGACAAAGCCGCGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCA
241+.....+.....+.....+.....+.....+.....+.....+.....+ 300
GGTTCCTGTTTCGGCGCCCTCCTCGTCATGTTGTCGTGCATGGCACACCAGTCCGAGGAGT
K T K P R E E Q Y N S T Y R V V S V L T
CCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAG
301+.....+.....+.....+.....+.....+.....+.....+.....+ 360
GGCAGGACGTGGTCTGACCGACTTACCGTTCCTCATGTTACGTTCCAGAGGTGTTTC
V L H Q D W L N G K E Y K C K V S N K A
CCCTCCCAGCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCAC
361+.....+.....+.....+.....+.....+.....+.....+.....+ 420
GGGAGGGTCGGGGGTAGCTCTTTTGGTAGAGGTTTCGGTTTCCCGTCGGGGCTCTTGGTG
L P A P I E K T I S K A K G Q P R E P Q
AGGTGTACACCCTGCCCCATCCCGGGATGAGCTGACCAAGAACCAGGTACGCTGACCT
421+.....+.....+.....+.....+.....+.....+.....+.....+ 480
TCCACATGTGGGACGGGGGTAGGGCCCTACTCGACTGGTTCCTTGGTCCAGTCCGACTGGA
V Y T L P P S R D E L T K N Q V S L T C
GCCTGGTCAAAGGCTTCTATCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGC
481+.....+.....+.....+.....+.....+.....+.....+.....+ 540
CGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGGCACCTCACCTCTCGTTACCCGTCC
L V K G F Y P S D I A V E W E S N G Q P
CGGAGAACAACCTACAAGACCACGCCTCCCGTCTGGACTCCGACGGCTCCTTCTTCCTCT
541+.....+.....+.....+.....+.....+.....+.....+.....+ 600
GCCTCTTGTGATGTTCTGGTGCAGGGGACGACCTGAGGCTGCCGAGGAAGAAGGAGA
E N N Y K T T P P V L D S D G S F F L Y
ACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCG
601+.....+.....+.....+.....+.....+.....+.....+.....+ 660
TGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTCGTCCCCTTGCAGAAGAGTACGAGGC
S K L T V D K S R W Q Q G N V F S C S V
TGATGCATGAGGCTCTGCACAACCACTACACGAGAAGAGCCTCTCCCTGTCTCCGGGTA
661+.....+.....+.....+.....+.....+.....+.....+.....+ 720
ACTACGTAATCCGAGACGTGTTGGTGTATGTCGTCTTCTCGGAGAGGGACAGAGGCCCAT
M H E A L H N H Y T Q K S L S L S P G K
AAGGTGGAGGTGGTGGTATCGAAGGTCCGACTCTGCGTCAGTGGCTGGCTGCTCGTGCTG
721+.....+.....+.....+.....+.....+.....+.....+.....+ 780
TTCCACCTCCACCACCATAGCTTCCAGGCTGAGACGCAGTCACCGACCGACGAGCAGCAG
G G G G G I E G P T L R Q W L A A R A G
GTGGTGGAGGTGGCGGCGGAGGTATTGAGGGCCCAACCCTTCGCCAATGGCTTGCAGCAC
781+.....+.....+.....+.....+.....+.....+.....+.....+ 840
CACCACCTCCACCGCGCCTCCATAACTCCCGGGTTGGGAAGCGGTTACCGAACGTCGTG
G G G G G G I E G P T L R Q W L A A R
BamHI
|
841 CGGCATAATCTCGAGGATCCG 861
CGCGTATTAGAGCTCCTAGGC

FIG. 9



XbaI

BamHI

AATGGATCC
 781 - - - - - 789
 TTACCTAGG

FIG.11

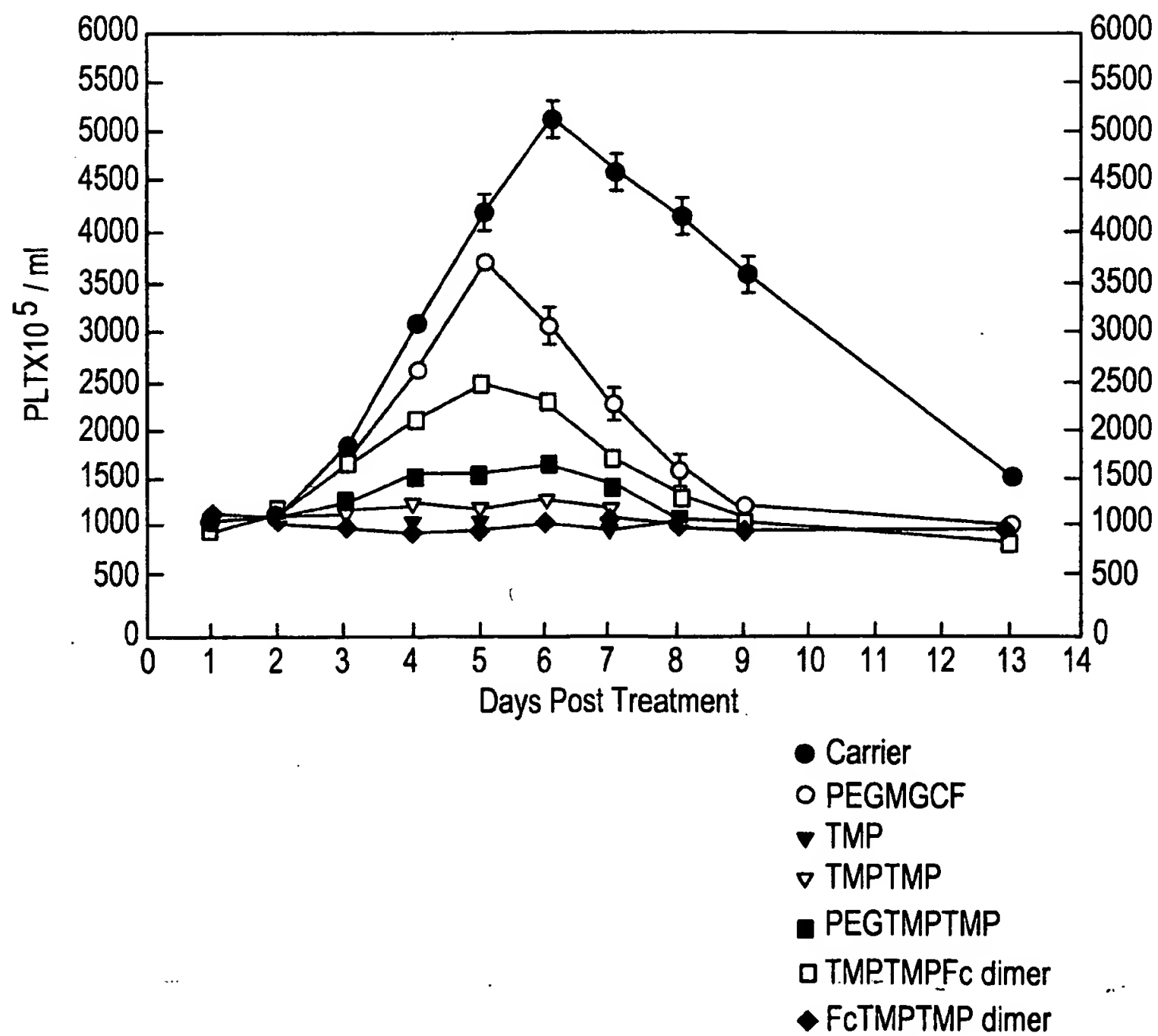


FIG.12

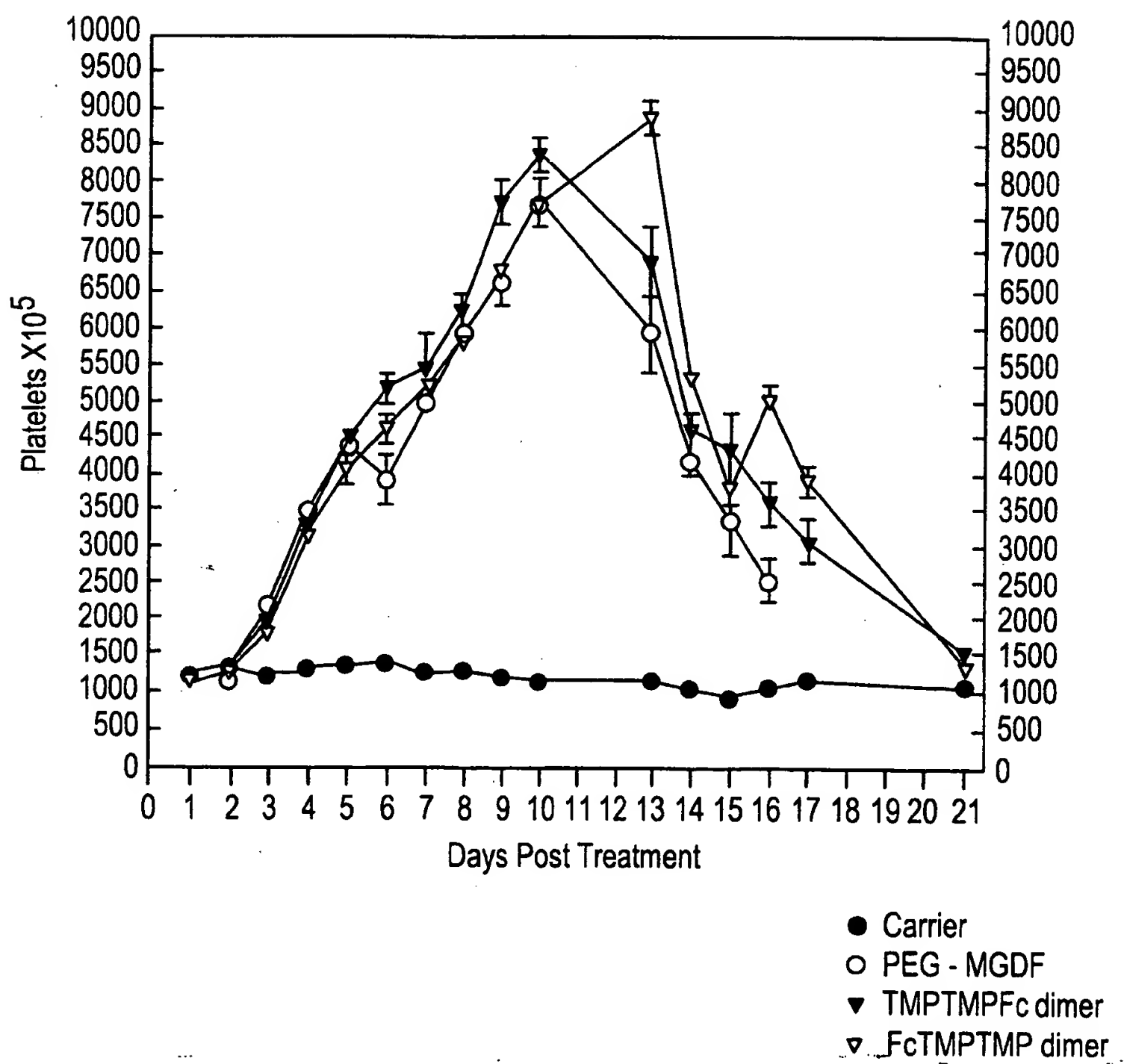


FIG. 13

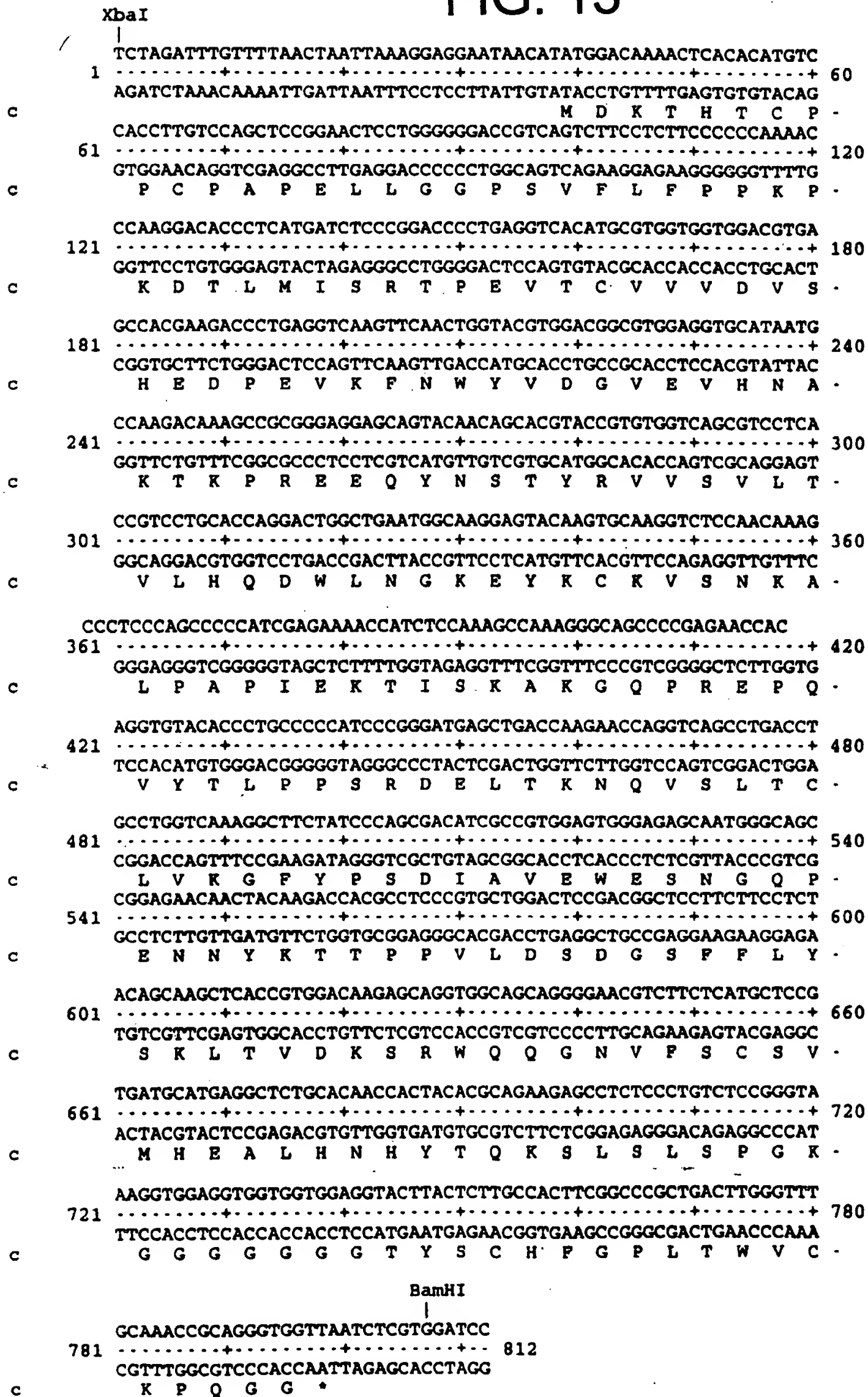


FIG. 14

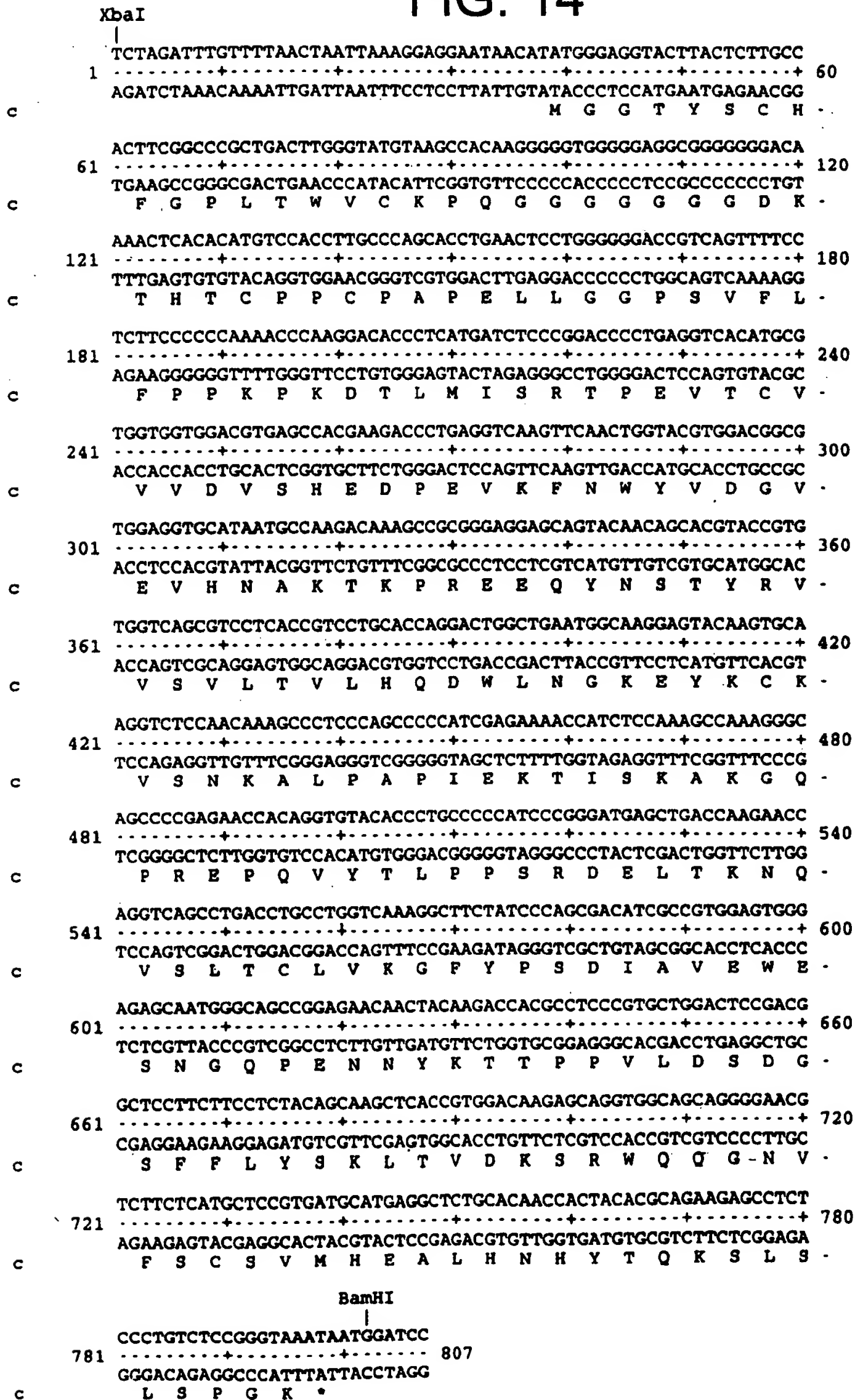


FIG. 15

FIG. 15

XbaI
|

1 TCTAGATTGAGTTTAACTTTTAGAAGGAGGAATAAAATATGGGAGGTACTTACTCTTG 60
-----+-----+-----+-----+-----+-----+-----+-----+-----+
AGATCTAAACTCAAATGAAAATCTTCCTCCTTATTTTATACCCTCCATGAATGAGAAC
M G G T Y S C

61 CCACTTCGGCCCACTGACTTGGGTTTGCAAACCGCAGGGTGGCGGCGGCGGCGGCGGTTGG 120
-----+-----+-----+-----+-----+-----+-----+-----+-----+
GGTGAAGCCGGGTGACTGAACCCAAACGTTTGGCGTCCACCGCCGCCGCCGCCGCCACC
H F G P L T W V C K P Q G G G G G G G G

121 TACCTATTCTGTCAATTTGGCCCCCTGACCTGGGTATGTAAGCCACAAGGGGGTGGGGG 180
-----+-----+-----+-----+-----+-----+-----+-----+-----+
ATGGATAAGGACAGTAAACCGGGCGACTGGACCCATACATTGGGTGTTCCCCCACCCTCC
T Y S C H F G P L T W V C K P Q G G G G G

181 AGCGGGGGGGGACAAACTCACACATGTCCACCTTGCCAGCACCTGAACTCCTGGGGGG 240
-----+-----+-----+-----+-----+-----+-----+-----+-----+
TCCGCCCCCCTGTTTGTAGTGTGTACAGGTGGAACGGGTCGTGGACTTGAGGACCCCCC
G G G D K T H T C P P C P A P E L L G G

241 ACCGTCAGTTTCTCTTCCCCCAAAACCAAGGACACCCTCATGATCTCCCGGACCCC 300
-----+-----+-----+-----+-----+-----+-----+-----+-----+
TGGCAGTCAAAGGAGAAGGGGGGTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGG
P S V F L F P P K P K D T L M I S R T P

301 TGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTG 360
-----+-----+-----+-----+-----+-----+-----+-----+-----+
ACTCCAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGAC
E V T C V V V D V S H E D P E V K F N W

361 GTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAA 420
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CATGCACCTGCCGCACCTCCACGTATTACGGTCTGTTTCGGCGCCCTCCTCGTCATGTT
Y V D G V E V H N A K T K P R E E Q Y N

421 CAGCACGTACCGTGTGGTGCAGCGTCTCACCGTCTGCACCAGGACTGGCTGAATGGCAA 480
-----+-----+-----+-----+-----+-----+-----+-----+-----+
GTCGTGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCTGACCGACTTACCGTT
S T Y R V V S V L T V L H Q D W L N G K

481 GGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCATCGAGAAAACCATCTC 540
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CCTCATGTTTACGTTCCAGAGGTTGTTTCGGGAGGGTGGGGGTAGCTCTTTTGGTAGAG
E Y K C K V S N K A L P A P I E K T I S

541 CAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCATCCCGGGATGA 600
-----+-----+-----+-----+-----+-----+-----+-----+-----+
GTTTCGGTTTCCCGTCCGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACT
K A K G Q P R E P Q V Y T L P P S R D E

601 GCTGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACAT 660
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CGACTGGTCTTGGTCCAGTCGGACTGGACGGACAGTTTCCGAAGATAGGGTCGCTGTA
L T R N Q V S L T C L V K G F Y P S D I

661 CGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACCTACAAGACCACGCCTCCCGT 720
-----+-----+-----+-----+-----+-----+-----+-----+-----+
GCGGCACCTCACCTCTCGTTACCGTCCGGCTCTTGTGATGTTCTGGTGGGAGGGCA
A V E W E S N G Q P E N N Y K T T P P V

721 GCTGGACTCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTG 780
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CGACCTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTGAGTGGCACCTGTTCTCGTCCAC
L D S D G S F F L Y S K L T V D K S R W

781 GCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACAC 840
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CGTCGTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTG
Q Q G N V F S C S V M H E A L H N H Y T

BamHI
|

841 GCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAATGGATCC 881
-----+-----+-----+-----+-----+-----+-----+-----+-----+
CGTCTTCTCGGAGAGGGACAGAGGCCATTATTACCTAGG
Q K S L S L S P G K

FIG. 16

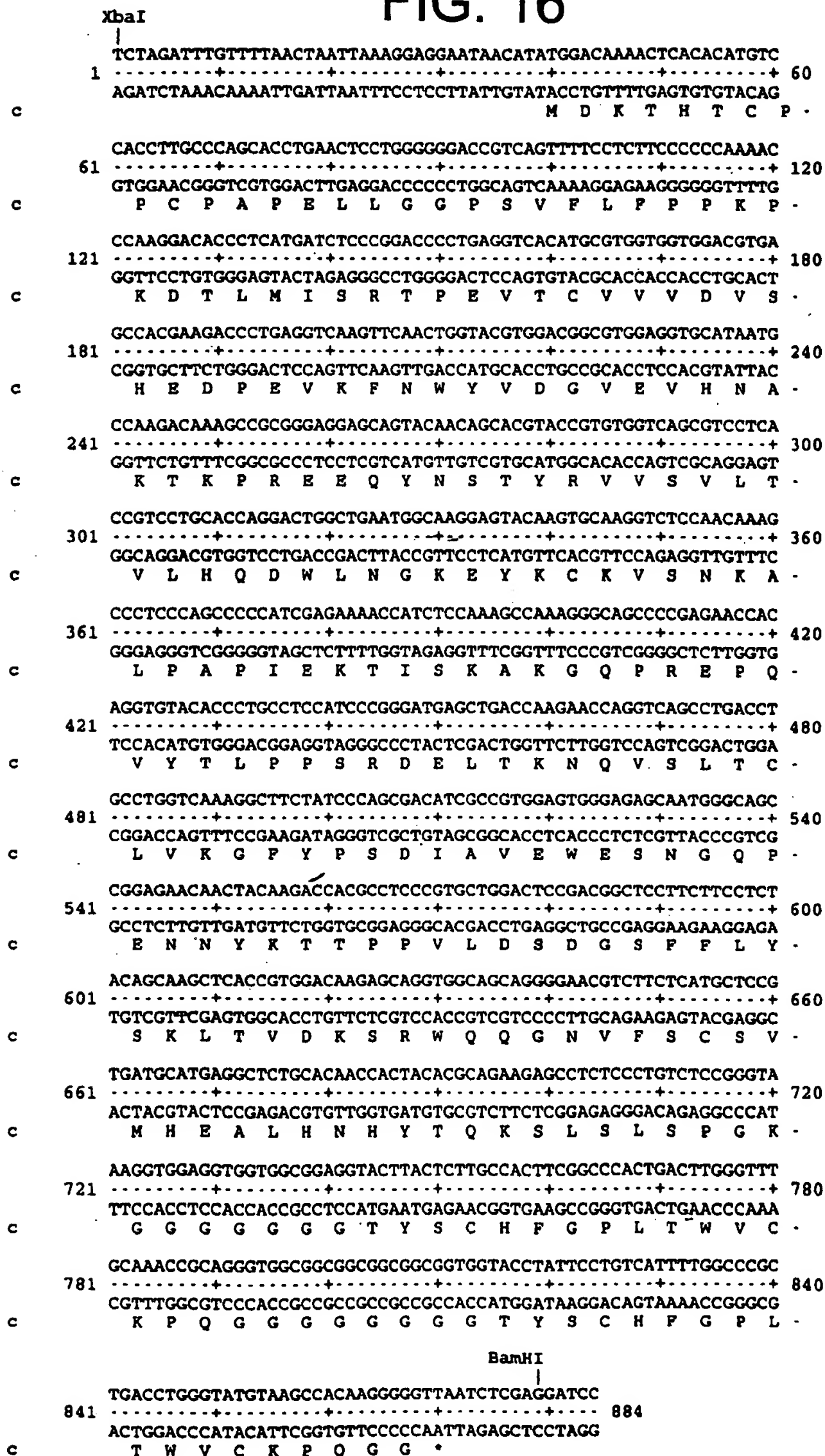


FIG. 17A

[AatII sticky end]
(position #4358 in pAMG21)

5' GCGTAACGTATGCATGGTCTCC-
3' TGCACGCATTGCATACGTACCAGAGG-

-CCATGCGAGAGTAGGGAACTGCCAGGCATCAAATAAAACGAAAGGCTCAGTCGAAAGACT-
-GGTACGCTCTCATCCCTTGACGGTCCGTAGTTTATTTTGCTTTCCGAGTCAGCTTTCTGA-
-GGGCCTTTCGTTTTATCTGTTGTTTGTCTGGTGAACGCTCTCCTGAGTAGGACAAATCCGC-
-CCCGGAAAGCAAATAGACAACAAACAGCCACTTGCGAGAGGACTCATCCTGTTTAGGCG-
-CGGGAGCGGATTTGAACGTTGCGAAGCAACGGCCCGGAGGGTGGCGGGCAGGACGCCCGC-
-GCCCTCGCCTAAACTTGCAACGCTTCGTTGCCGGGCTCCACCGCCCGTCCTGCGGGCG-
-CATAAACTGCCAGGCATCAAATTAAGCAGAAGGCCATCCTGACGGATGGCCTTTTTGCGT-
-GTATTTGACGGTCCGTAGTTTAATTCGTCTTCCGGTAGGACTGCCTACCGGAAAAACGCA-
-TTCTACAACTCTTTTGTTTATTTTCTAAATACATTCAAATATGGACGTCGTACTTAAC-
-AAGATGTTTGAGAAAACAAATAAAAAGATTTATGTAAGTTTATACCTGCAGCATGAATTG-
-TTTTAAAGTATGGGCAATCAATTGCTCCTGTTAAAATTGCTTTAGAAATACTTTGGCAGC-
-AAAATTTCATACCCGTTAGTTAACGAGGACAATTTTAACGAAATCTTTATGAAACCGTCG-
-GGTTTGTGTTGATTGAGTTTCATTTGCGCATTGGTTAAATGGAAAGTGACCGTGCGCTTAC-
-CCAAACAACATAACTCAAAGTAAACGCGTAACCAATTTACCTTTCCTGACGCGGAATG-
-TACAGCCTAATATTTTTGAAATATCCCAAGAGCTTTTTCTTCGCATGCCACGCTAAAC-
-ATGTCGGATTATAAAAACCTTTATAGGGTTCTCGAAAAAGGAAGCGTACGGGTGCGATTG-
-ATTCTTTTTCTCTTTTGGTTAAATCGTTGTTTGAATTTATTTGCTATATTTATTTTTC-
-TAAGAAAAAGAGAAAACCAATTTAGCAACAACTAAATAATAAACGATATAAATAAAAAG-
-GATAATTATCAACTAGAGAAGGAACAATTAATGGTATGTTTCATACACGCATGTAAAAATA-
-CTATTAATAGTTGATCTCTTCTTCTGTTAATTACCATAACAAGTATGTGCGTACATTTTTAT-
-AACTATCTATATAGTTGTCTTTCTCTGAATGTGCAAACTAAGCATTCGGAAGCCATTAT-
-TTGATAGATATATCAACAGAAAGAGACTTACACGTTTTGATTCGTAAGGCTTCGGTAATA-
-TAGCAGTATGAATAGGGAACTAAACCCAGTGATAAGACCTGATGATTTGCTTCTTTAA-
-ATCGTCATACTTATCCCTTTGATTTGGGTCATTTCTGGACTACTAAAGCGAAGAAATT-
-TTACATTTGGAGATTTTTTATTTACAGCATTGTTTTCAAATATATTCCAATTAATCGGTG-
-AATGTAAACCTCTAAAAAATAAATGTCGTAACAAAAGTTTATATAAGGTTAATTAGCCAC-
-AATGATTGGAGTTAGAATAATCTACTATAGGATCATATTTTATTAAATTAGCGTCATCAT-
-TTACTAACCTCAATCTTATTAGATGATATCCTAGTATAAAATAATTTAATCGCAGTAGTA-
-AATATTGCCTCCATTTTTTAGGGTAATTATCCAGAATTGAAATATCAGATTTAACCATAG-
-TTATAACGGAGGTAAAAAATCCCATTAATAGGTCTTAACCTTTATAGTCTAAATTGGTATC-
-AATGAGGATAAATGATCGCGAGTAAATAATATTCACAATGTACCATTTTAGTCATATCAG-
-TTACTCCTATTTACTAGCGCTCATTTATTATAAGTGTTACATGGTAAATCAGTATAGTC-
-ATAAGCATTGATTAATATCATTATTGCTTCTACAGGCTTTAATTTTATTAATTATTCTGT-
-TATTCGTAACCTAATTATAGTAATAACGAAGATGTCCGAAATTAAATAATTAATAAGACA-
-AAGTGTCTGTCGGCATTATGTCTTTCATACCCATCTCTTTATCCTTACCTATTGTTTGTC-
-TTCACAGCAGCCGTAAATACAGAAAGTATGGGTAGAGAAATAGGAATGGATAACAAACAG-
-GCAAGTTTTGCGTGTTATATATCATTAAAACGGTAATAGATTGACATTTGATTCTAATAA-
-CGTTCAAACGCACAATATATAGTAATTTTGCCATTATCTAACTGTAACTAAGATTATT-

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FIG. 17B

- ATTGGATTTTGTGTCACACTATTATATCGCTTGAAATACAATTGTTTAAACATAAGTACCTG -
- TAACCTAAAAACAGTGTGATAATATAGCGAACTTTATGTTAACAAATTGTATTCATGGAC -
- TAGGATCGTACAGGTTTACGCAAGAAAATGGTTTGTATAGTCGATTAATCGATTTGATT -
- ATCCTAGCATGTCCAAATGCGTTCCTTTACCAACAATATCAGCTAATTAGCTAAACTAA -
- CTAGATTTGTTTTAACTAATTAAAGGAGGAATAACATATGGTTAACGCGTTGGAATTCGA -
- GATCTAAACAAAATTGATTAATTCCTCCTTATTGTATACCAATTGCGCAACCTTAAGCT -
- GCTCACTAGTGTGCGACCTGCAGGGTACCATGGAAGCTTACTCGAGGATCCGCGGAAAGAA -
- CGAGTGATCACAGCTGGACGTCCCATGGTACCTTCGAATGAGCTCCTAGGCGCCTTTCTT -
- GAAGAAGAAGAAGAAAGCCCGAAAGGAAGCTGAGTTGGCTGCTGCCACCGCTGAGCAATA -
- CTTCTTCTTCTTCTTTCGGGCTTTCCTTCGACTCAACCGACGACGGTGGCGACTCGTTAT -
- ACTAGCATAACCCCTTGGGGCCTCTAAACGGGTCTTGAGGGGTTTTTTTGCTGAAAGGAGG -
- TGATCGTATTGGGGAACCCCGGAGATTGCCCAGAACTCCCCAAAAACGACTTTCCTCC -
- AACCGCTCTTCACGCTCTTCACGC 3' [SacII sticky end]
- TTGGCGAGAAGTGCGAGAAGTG 5' (position #5904 in pAMG21)

FIG.18A - 1

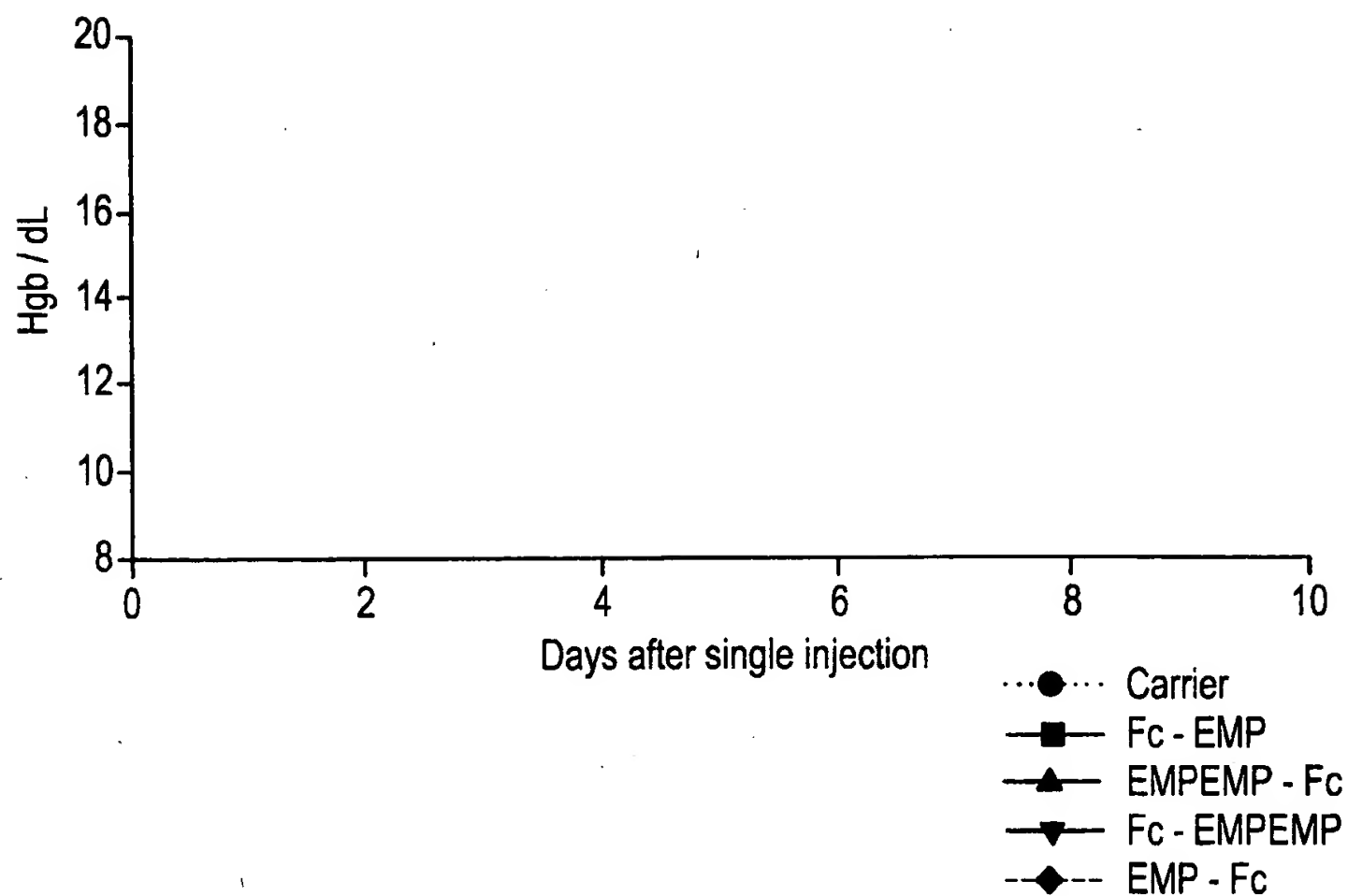
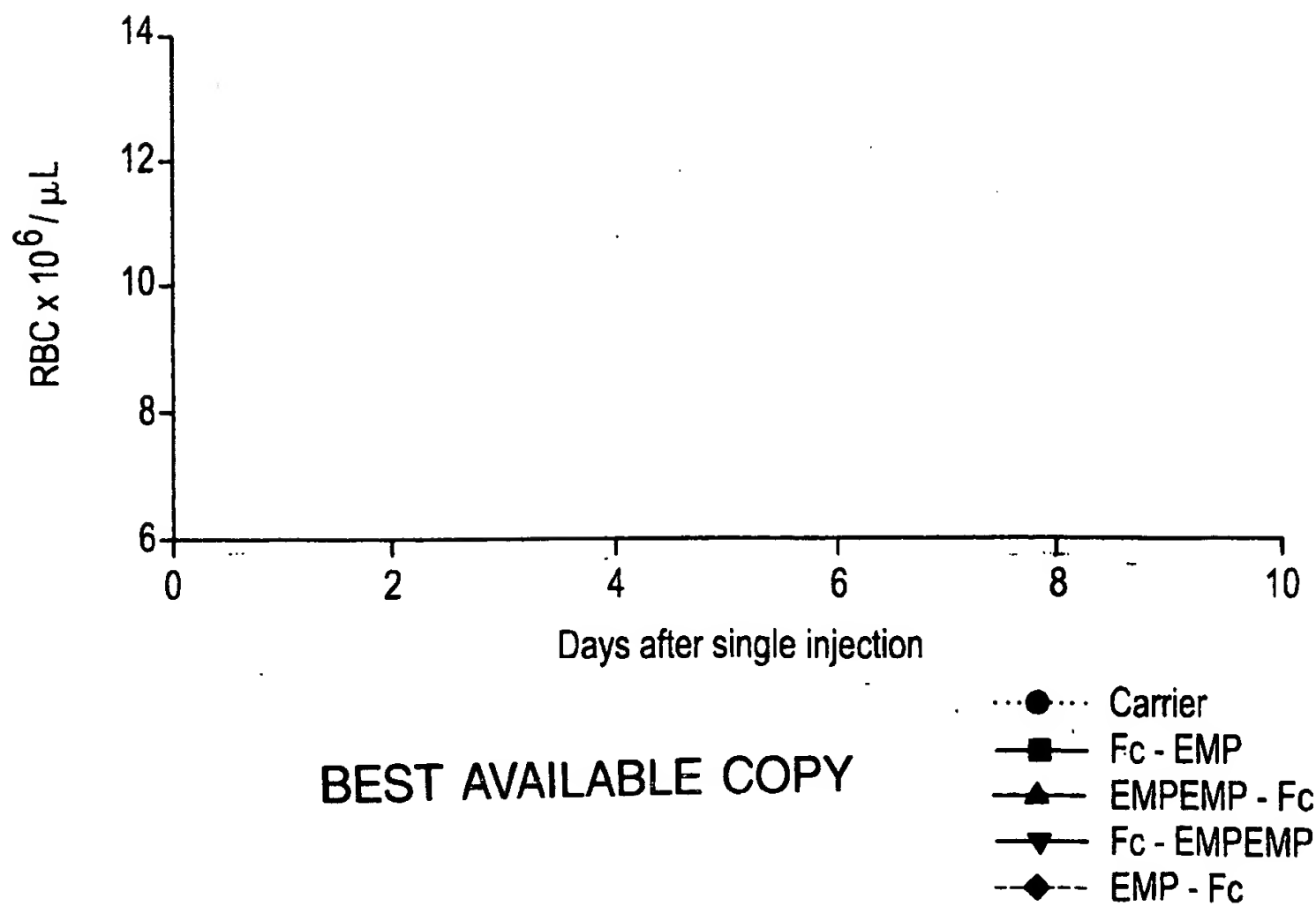


FIG.18A - 2



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FIG.18A - 3

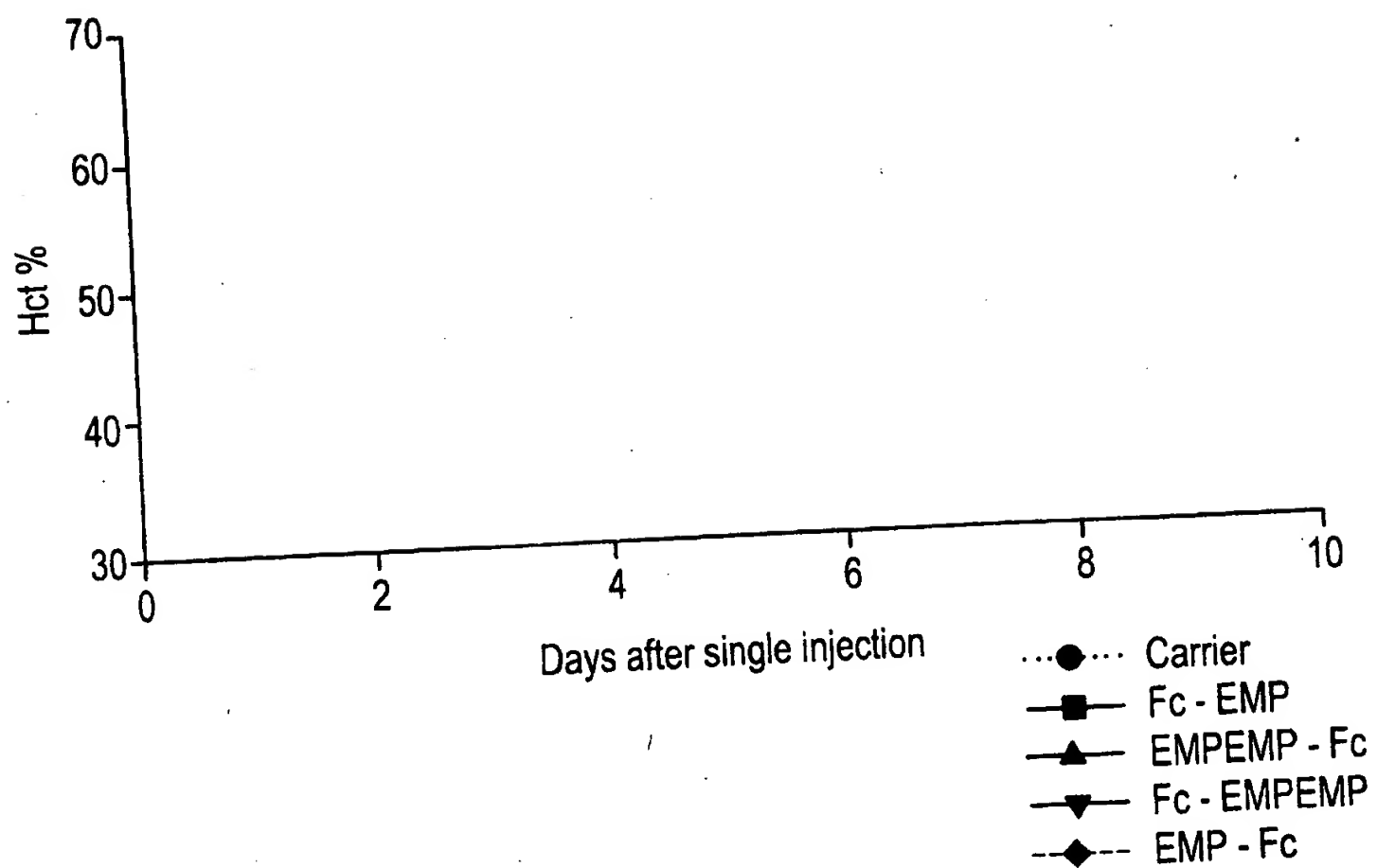
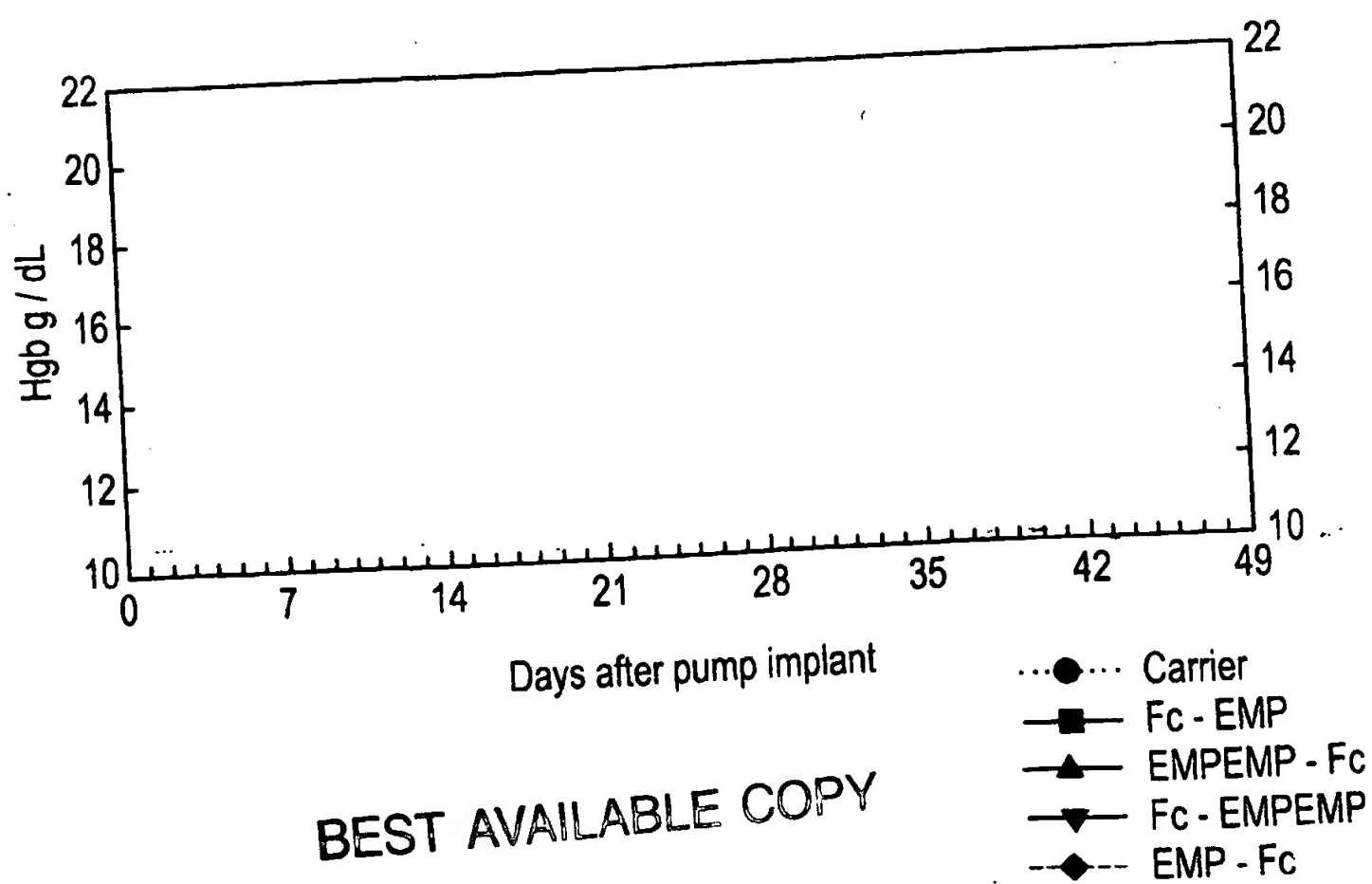


FIG.18B - 1



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FIG.18B - 2

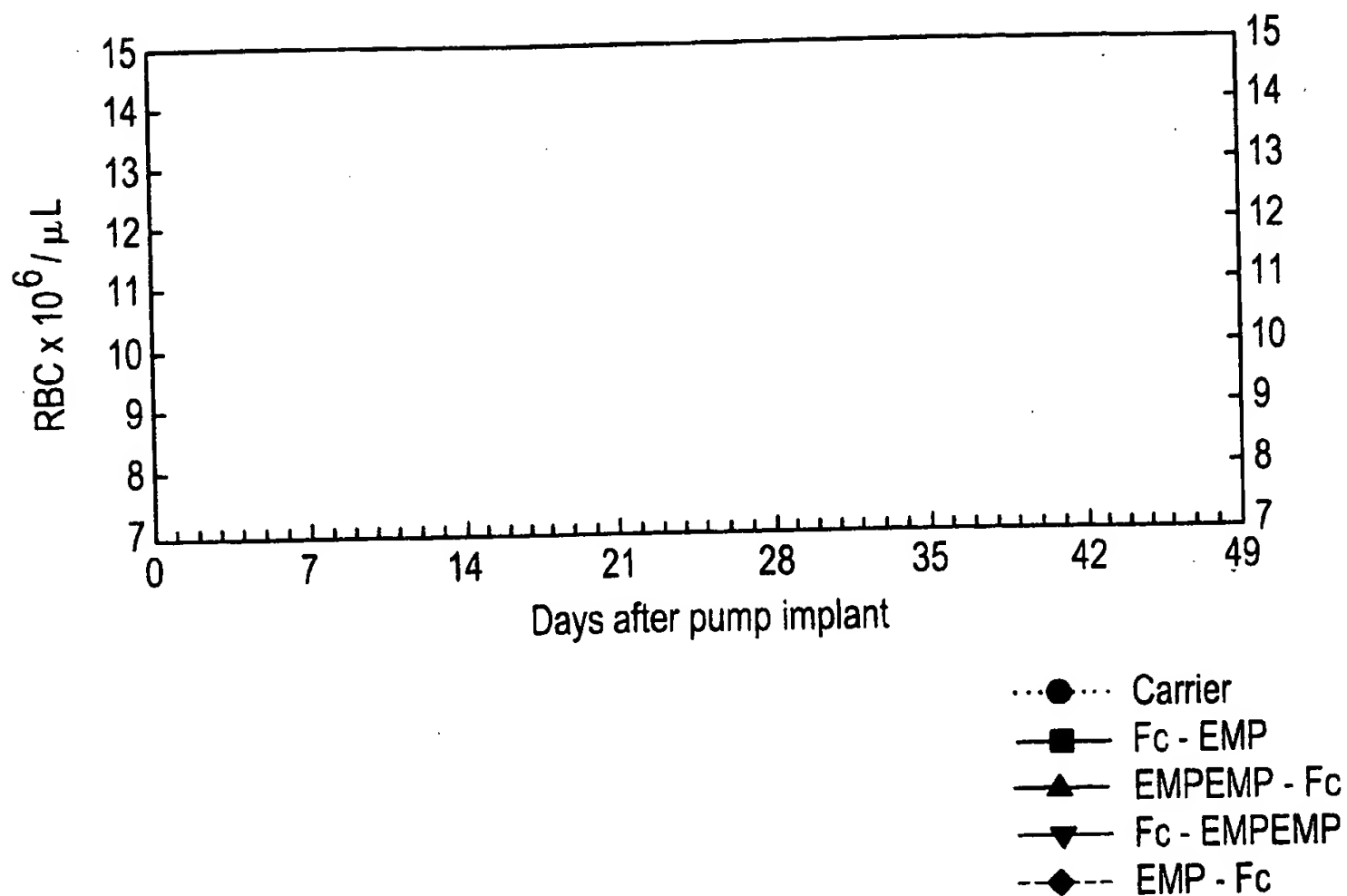
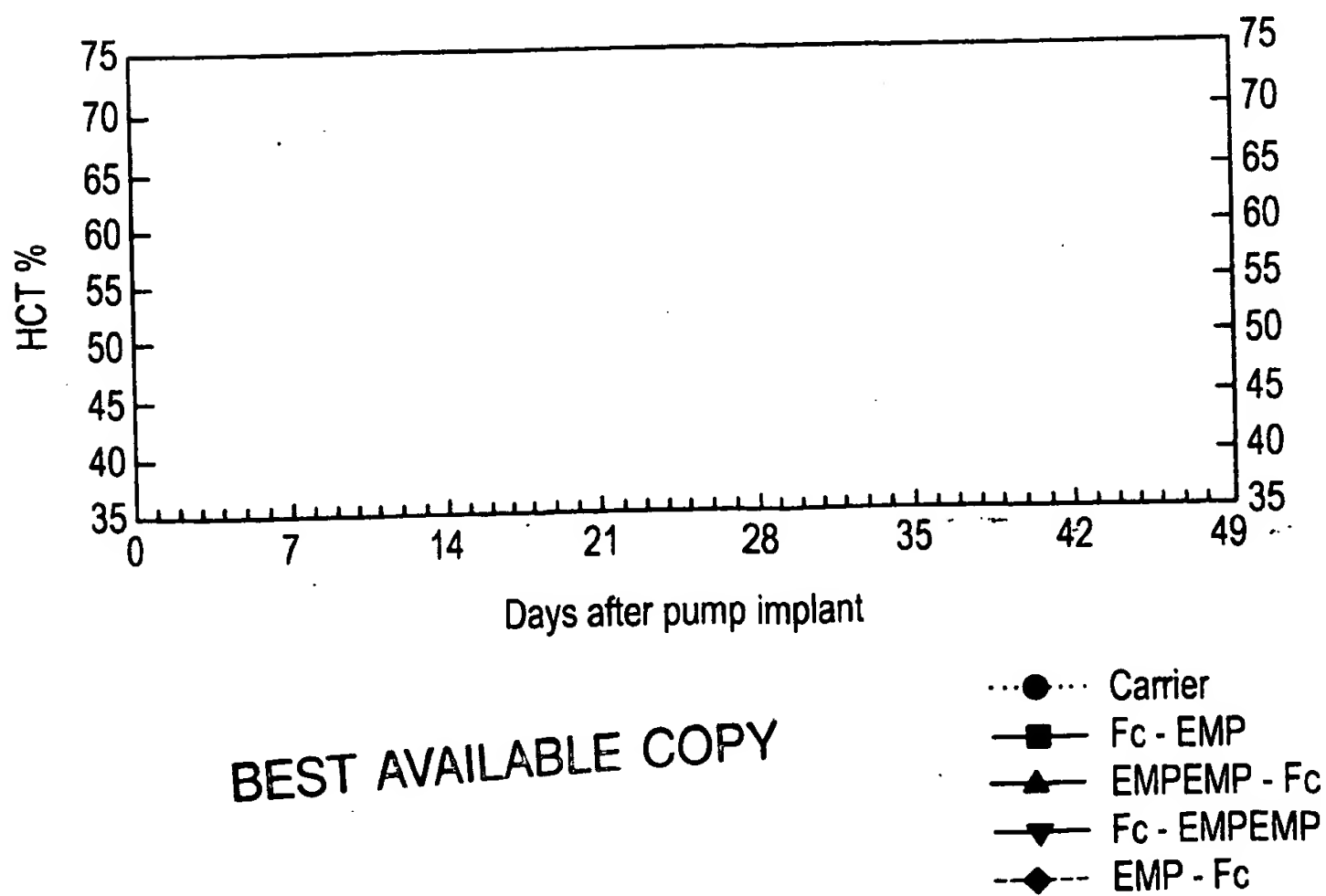


FIG.18B - 3



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FIG. 19A

NdeI

1 CATATGGACAAAACTCACACATGTCCACCTTGTCAGCTCCGGAACCTCCTGGGGGGACCG 60
-----+-----+-----+-----+-----+-----+-----+-----+
GTATACCTGTTTTGAGTGTGTACAGGTGGAACAGGTTCGAGGCCTTGAGGACCCCCCTGGC

a M D K T H T C P P C P A P E L L G G P -
TCAGTCTTCCTCTTCCCCCAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAG 120
61 -----+-----+-----+-----+-----+-----+-----+-----+
AGTCAGAAGGAGAAGGGGGGTTTTGGGTTCCTGTGGGAGTACTAGAGGGCCTGGGGACTC

a S V F L F P P K P K D T L M I S R T P E -
GTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTAC 180
121 -----+-----+-----+-----+-----+-----+-----+-----+
CAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATG

a V T C V V V D V S H E D P E V K F N W Y -
GTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGC 240
181 -----+-----+-----+-----+-----+-----+-----+-----+
CACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTCTG

a V D G V E V H N A K T K P R E E Q Y N S -
ACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAG 300
241 -----+-----+-----+-----+-----+-----+-----+-----+
TGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCGTTCCTC

a T Y R V V S V L T V L H Q D W L N G K E -
TACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCATCGAGAAAACCATCTCCAAA 360
301 -----+-----+-----+-----+-----+-----+-----+-----+
ATGTTACGTTCCAGAGGTTGTTTCGGGAGGGTTCGGGGGTAGCTCTTTTGGTAGAGGTTT

a Y K C K V S N K A L P A P I E K T I S K -
GCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTG 420
361 -----+-----+-----+-----+-----+-----+-----+-----+
CGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGAC

a A K G Q P R E P Q V Y T L P P S R D E L -
ACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC 480
421 -----+-----+-----+-----+-----+-----+-----+-----+
TGGTTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGG

a T K N Q V S L T C L V K G F Y P S D I A -
GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACCTACAAGACCACGCCTCCCGTGCTG 540
481 -----+-----+-----+-----+-----+-----+-----+-----+
CACCTCACCTCTCGTTACCCGTCGGCCTCTTGTGATGTTCTGGTGCAGGGGCACGAC

a V E W E S N G Q P E N N Y K T T P P V L -
GACTCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG 600
541 -----+-----+-----+-----+-----+-----+-----+-----+
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTC

a D S D G S F F L Y S K L T V D K S R W Q -

FIG. 19B

601 CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG 660
-----+-----+-----+-----+-----+-----+
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
AAGAGCCTCTCCCTGTCTCCGGGTAAAGGTGGAGGTGGTGGTGACTTCCTGCCGCACTAC
661 -----+-----+-----+-----+-----+-----+ 720
TTCTCGGAGAGGGACAGAGGCCCATTTCCACCTCCACCACCACTGAAGGACGGCGTGATG
a K S L S L S P G K G G G G G D F L P H Y -
BamHI
|
AAAAACACCTCTCTGGGTCACCGTCCGTAATGGATCC
721 -----+-----+-----+-----+-----+ 757
TTTTTGTGGAGAGACCCAGTGGCAGGCATTACCTAGG
a K N T S L G H R P *

FIG. 20A

NdeI
|
CATATGGACTTCCTGCCGCACTACAAAAACACCTCTCTGGGTACCGTCCGGGTGGAGGC 60
1 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GTATACCTGAAGGACGGCGTGATGTTTTGTGGAGAGACCCAGTGGCAGGCCACCTCCG
a M D F L P H Y K N T S L G H R P G G G -
GGTGGGGACAAACTCACACATGTCCACCTTGCCCAGCACCTGAACTCCTGGGGGGACCG 120
61 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CCACCCCTGTTTTGAGTGTGTACAGGTGGAACGGGTCGTGGACTTGAGGACCCCCCTGGC
a G G D K T H T C P P C P A P E L L G G P -
TCAGTTTTCTCTTCCCCCAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAG 180
121 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
AGTCAAAGGAGAAGGGGGGTTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGGACTC
a S V F L F P P K P K D T L M I S R T P E -
GTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTAC 240
181 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATG
a V T C V V V D V S H E D P E V K F N W Y -
GTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGC 300
241 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTGC
a V D G V E V H N A K T K P R E E Q Y N S -
ACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAAGGACTGGCTGAATGGCAAGGAG 360
301 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
TGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCGTTCCTC
a T Y R V V S V L T V L H Q D W L N G K E -
TACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAA 420
361 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
ATGTTACAGTTCCAGAGGTTGTTTCGGGAGGGTTCGGGGGTAGCTCTTTTGGTAGAGGTTT
a Y K C K V S N K A L P A P I E K T I S K -
GCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTG 480
421 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGAC
a A K G Q P R E P Q V Y T L P P S R D E L -
ACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC 540
481 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
TGGTTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGG
a T K N Q V S L T C L V K G F Y P S D I A -
GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAATAAGACCACGCCTCCCGTGCTG 600
541 -----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
CACCTCACCTCTCGTTACCCGTCGGCCTCTTGTTGATGTTCTGGTGCGGAGGGCACGAC
a V E W E S N G Q P E N N Y K T T P P V L -

FIG. 20B

601 GACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG 660
-----+-----+-----+-----+-----+
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTGAGTGGCACCTGTTCTCGTCCACCGTC
a D S D G S F F L Y S K L T V D K S R W Q -
CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG
661 -----+-----+-----+-----+-----+ 720
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
BamHI
|
AAGAGCCTCTCCCTGTCTCCGGGTAAATAATGGATCCGCGG
721 -----+-----+-----+-----+ 761
TTCTCGGAGAGGGACAGAGGCCCATTTATTACCTAGGCGCC
a K S L S L S P G K *

FIG. 21A

NdeI
|
CATATGGACAAAACTCACACATGTCCACCTTGTCCAGCTCCGGAACCTCCTGGGGGGACCG
1+.....+.....+.....+.....+.....+.....+ 60
GTATACCTGTTTTGAGTGTGTACAGGTGGAACAGGTCGAGGCCTTGAGGACCCCCCTGGC
a M D K T H T C P P C P A P E L L G G P -
TCAGTCTTCCTCTTCCCCCAAACCAAGGACACCCTCATGATCTCCCGGACCCCTGAG
61+.....+.....+.....+.....+.....+.....+ 120
AGTCAGAAGGAGAAGGGGGGTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGGACTC
a S V F L F P P K P K D T L M I S R T P E -
GTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTAC
121+.....+.....+.....+.....+.....+.....+ 180
CAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATG
a V T C V V V D V S H E D P E V K F N W Y -
GTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGC
181+.....+.....+.....+.....+.....+.....+ 240
CACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTCG
a V D G V E V H N A K T K P R E E Q Y N S -
ACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAG
241+.....+.....+.....+.....+.....+.....+ 300
TGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCGTTCCTC
a T Y R V V S V L T V L H Q D W L N G K E -
TACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAA
301+.....+.....+.....+.....+.....+.....+ 360
ATGTTACGTTCCAGAGGTTGTTTCGGGAGGGTCGGGGGTAGCTCTTTTGGTAGAGGTTT
a Y K C K V S N K A L P A P I E K T I S K -
GCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTG
361+.....+.....+.....+.....+.....+.....+ 420
CGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGAC
a A K G Q P R E P Q V Y T L P P S R D E L -
ACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCAGCGACATCGCC
421+.....+.....+.....+.....+.....+.....+ 480
TGGTTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGG
a T K N Q V S L T C L V K G F Y P S D I A -
GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGACCACGCCTCCCGTGCTG
481+.....+.....+.....+.....+.....+.....+ 540
CACCTCACCTCTCGTTACCCGTCGGCCTCTTGTGATGTTCTGGTGCAGGAGGGCACGAC
a V E W E S N G Q P E N N Y K T T P P V L -
GACTCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG
541+.....+.....+.....+.....+.....+.....+ 600
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTC
a D S D G S F F L Y S K L T V D K S R W Q -

FIG. 21B

601 CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG 660
-----+-----+-----+-----+-----+-----+
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
AAGAGCCTCTCCCTGTCTCCGGGTAAAGGTGGAGGTGGTGGTTTCGAATGGACCCCGGGT
661 -----+-----+-----+-----+-----+-----+ 720
TTCTCGGAGAGGGACAGAGGCCCATTTCCACCTCCACCACCAAAGCTTACCTGGGGCCCA
a K S L S L S P G K G G G G G F E W T P G -
BamHI
|
TACTGGCAGCCGTACGCTCTGCCGCTGTAATGGATCCCTCGAG
721 -----+-----+-----+-----+-----+ 763
ATGACCGTCGGCATGCGAGACGGCGACATTACCTAGGGAGCTC
a Y W Q P Y A L P L *

FIG. 22B

601 GACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG 660
-----+-----+-----+-----+-----+-----+
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTC
a D S D G S F F L Y S K L T V D K S R W Q -
CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG
661 -----+-----+-----+-----+-----+-----+ 720
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
BamHI
|
AAGAGCCTCTCCCTGTCTCCGGGTAAATAATGGATCC
721 -----+-----+-----+-----+-----+ 757
TTCTCGGAGAGGGACAGAGGCCCATTTATTACCTAGG
a K S L S L S P G K *

FIG. 23A

NdeI
|
CATATGGACAAAACTCACACATGTCCACCGTGCCCAGCACCTGAACTCCTGGGGGGACCG
1 -----+-----+-----+-----+-----+-----+-----+ 60
GTATACCTGTTTTGAGTGTGTACAGGTGGCACGGGTCGTGGACTTGAGGACCCCCCTGGC
a M D K T H T C P P C P A P E L L G G P -
TCAGTTTTCTCTTCCCCCAAAACCAAGGACACCCTCATGATCTCCCGGACCCCTGAG
61 -----+-----+-----+-----+-----+-----+-----+ 120
AGTCAAAGGAGAAGGGGGGTTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGGACTC
a S V F L F P P K P K D T L M I S R T P E -
GTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTAC
121 -----+-----+-----+-----+-----+-----+-----+ 180
CAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATG
a V T C V V V D V S H E D P E V K F N W Y -
GTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGC
181 -----+-----+-----+-----+-----+-----+-----+ 240
CACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTCTG
a V D G V E V H N A K T K P R E E Q Y N S -
ACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAG
241 -----+-----+-----+-----+-----+-----+-----+ 300
TGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCGTTCCTC
a T Y R V V S V L T V L H Q D W L N G K E -
TACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCATCGAGAAAACCATCTCCAAA
301 -----+-----+-----+-----+-----+-----+-----+ 360
ATGTTACGTTCCAGAGGTTGTTTCGGGAGGGTCGGGGGTAGCTCTTTTGGTAGAGGTTT
a Y K C K V S N K A L P A P I E K T I S K -
GCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTG
361 -----+-----+-----+-----+-----+-----+-----+ 420
CGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGAC
a A K G Q P R E P Q V Y T L P P S R D E L -
ACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
421 -----+-----+-----+-----+-----+-----+-----+ 480
TGGTTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGG
a T K N Q V S L T C L V K G F Y P S D I A -
GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGACCACGCCTCCCGTGCTG
481 -----+-----+-----+-----+-----+-----+-----+ 540
CACCTCACCTCTCGTTACCCGTCGGCCTCTTGTTGATGTTCTGGTGCGGAGGGGCACGAC
a V E W E S N G Q P E N N Y K T T P P V L -
GACTCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG
541 -----+-----+-----+-----+-----+-----+-----+ 600
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTC
a D S D G S F F L Y S K L T V D K S R W Q -

FIG. 23B

601 CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG 660
-----+-----+-----+-----+-----+-----+
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
AAGAGCCTCTCCCTGTCTCCGGGTAAAGGTGGTGGTGGTGGTGGTGGTGAACCGAACTGTGAC
661 -----+-----+-----+-----+-----+-----+ 720
TTCTCGGAGAGGGACAGAGGCCCATTTCCACCACCACCACCACAACCTGGCTTGACACTG
a K S L S L S P G K G G G G G V E P N C D -
BamHI
|
ATCCATGTTATGTGGAATGGGAATGTTTTGAACGTCTGTAACCTCGAGGATCC
721 -----+-----+-----+-----+-----+-----+ 773
TAGGTACAATACACCCTTACCCTTACAAAACCTTGCAGACATTGAGCTCCTAGG
a I H V M W E W E C F E R L *

FIG. 24A

NdeI
|
CATATGGTTGAACCGAACTGTGACATCCATGTTATGTGGGAATGGGAATGTTTTGAACGT
1+.....+.....+.....+.....+.....+.....+ 60
GTATACCAACTTGGCTTGACACTGTAGGTACAATACACCCTTACCCTTACAAAACCTTGCA
a M V E P N C D I H V M W E W E C F E R -
CTGGGTGGTGGTGGTGGTGGTGACAAACTCACACATGTCCACCGTGCCCAGCACCTGAACTC
61+.....+.....+.....+.....+.....+.....+ 120
GACCCACCACCACCACCCTGTTTGTAGTGTGTACAGGTGGCACGGGTTCGTGGACTTGAG
a L G G G G G D K T H T C P P C P A P E L -
CTGGGGGGACCGTCAGTTTTCTCTTCCCCCAAACCCAAGGACACCCTCATGATCTCC
121+.....+.....+.....+.....+.....+.....+ 180
GACCCCCCTGGCAGTCAAAGGAGAAGGGGGGTTTTGGGTTCTGTGGGAGTACTAGAGG
a L G G P S V F L F P P K P K D T L M I S -
CGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAG
181+.....+.....+.....+.....+.....+.....+ 240
GCCTGGGGACTCCAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTC
a R T P E V T C V V V D V S H E D P E V K -
TTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAG
241+.....+.....+.....+.....+.....+.....+ 300
AAGTTGACCATGCACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTC
a F N W Y V D G V E V H N A K T K P R E E -
CAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTG
301+.....+.....+.....+.....+.....+.....+ 360
GTCATGTTGTCGTGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGAC
a Q Y N S T Y R V V S V L T V L H Q D W L -
AATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAA
361+.....+.....+.....+.....+.....+.....+ 420
TTACCGTTCCTCATGTTACGTTCCAGAGGTGTTTTCGGGAGGGTTCGGGGGTAGCTCTTT
a N G K E Y K C K V S N K A L P A P I E K -
ACCATCTCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCC
421+.....+.....+.....+.....+.....+.....+ 480
TGGTAGAGGTTTCGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGG
a T I S K A K G Q P R E P Q V Y T L P P S -
CGGGATGAGCTGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCC
481+.....+.....+.....+.....+.....+.....+ 540
GCCCTACTCGACTGGTTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGG
a R D E L T K N Q V S L T C L V K G F Y P -
AGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGACCACG
541+.....+.....+.....+.....+.....+.....+ 600
TCGCTGTAGCGGCACCTCACCCTCTCGTTACCCGTCGGCCTCTTGTTGATGTTCTGGTGC
a S D I A V E W E S N G Q P E N N Y K T T -

FIG. 24B

601 CCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAG 660
-----+-----+-----+-----+-----+-----+
GGAGGGCACGACCTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTC
a P P V L D S D G S F F L Y S K L T V D K -
AGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAAC
661 -----+-----+-----+-----+-----+-----+ 720
TCGTCCACCGTCGTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTG
a S R W Q Q G N V F S C S V M H E A L H N -
BamHI
|
721 CACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAACTCGAGGATCC 773
-----+-----+-----+-----+-----+-----+
GTGATGTGCGTCTTCTCGGAGAGGGACAGAGGCCCATTTATTGAGCTCCTAGG
a H Y T Q K S L S L S P G K *

FIG. 25A

NdeI
|
CATATGGACAAACTCACACATGTCCACCTTGTCCAGCTCCGGAACCTCCTGGGGGGACCG
1 -----+-----+-----+-----+-----+-----+-----+ 60
GTATACCTGTTTTGAGTGTGTACAGGTGGAACAGGTTCGAGGCCTTGAGGACCCCCCTGGC

a M D K T H T C P P C P A P E L L G G P -

TCAGTCTTCCTCTTCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAG
61 -----+-----+-----+-----+-----+-----+-----+ 120
AGTCAGAAGGAGAAGGGGGGTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGGGGACTC

a S V F L F P P K P K D T L M I S R T P E -

GTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTAC
121 -----+-----+-----+-----+-----+-----+-----+ 180
CAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTGACCATG

a V T C V V V D V S H E D P E V K F N W Y -

GTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGC
181 -----+-----+-----+-----+-----+-----+-----+ 240
CACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATGTTGTGCG

a V D G V E V H N A K T K P R E E Q Y N S -

ACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAG
241 -----+-----+-----+-----+-----+-----+-----+ 300
TGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCTGACCGACTTACCGTTCCTC

a T Y R V V S V L T V L H Q D W L N G K E -

TACAAGTGCAAGGTCTCCAACAAAGCCCTCCAGCCCCCATCGAGAAAACCATCTCCAAA
301 -----+-----+-----+-----+-----+-----+-----+ 360
ATGTTACGTTCCAGAGGTTGTTTCGGGAGGGTTCGGGGGTAGCTCTTTTGGTAGAGGTTT

a Y K C K V S N K A L P A P I E K T I S K -

GCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGATGAGCTG
361 -----+-----+-----+-----+-----+-----+-----+ 420
CGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTACTCGAC

a A K G Q P R E P Q V Y T L P P S R D E L -

ACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
421 -----+-----+-----+-----+-----+-----+-----+ 480
TGGTCTTGGTCCAGTCGGACTGGACGGACCAGTTTCCGAAGATAGGGTCGCTGTAGCGG

a T K N Q V S L T C L V K G F Y P S D I A -

GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGACCACGCCTCCCGTGCTG
481 -----+-----+-----+-----+-----+-----+-----+ 540
CACCTCACCTCTCGTTACCCGTCGGCCTCTTGTGATGTTCTGGTGCGGAGGGCACGAC

a V E W E S N G Q P E N N Y K T T P P V L -

GACTCCGACGGCTCCTTCTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAG
541 -----+-----+-----+-----+-----+-----+-----+ 600
CTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCCACCGTC

a D S D G S F F L Y S K L T V D K S R W Q -

FIG. 25B

601 CAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAG 660
-----+-----+-----+-----+-----+-----+
GTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATGTGCGTC
a Q G N V F S C S V M H E A L H N H Y T Q -
AAGAGCCTCTCCCTGTCTCCGGGTAAAGGTGGAGGTGGTGGTTGCACCACCACTGGGGT
661 -----+-----+-----+-----+-----+-----+ 720
TTCTCGGAGAGGGACAGAGGCCCATTTCCACCTCCACCACCAACGTGGTGGGTGACCCCA
A K S L S L S P G K G G G G G C T T H W G -
BamHI
|
TTCACCCTGTGCTAATGGATCCCTCGAG
721 -----+-----+-----+-----+-----+ 748
AAGTGGGACACGATTACCTAGGGAGCTC
a F T L C *

FIG. 26A

NdeI
|
CATATGTGCACCACCCACTGGGGTTTCACCCTGTGCGGTGGAGGCGGTGGGGACAAAGGT
1+.....+.....+.....+.....+.....+.....+ 60
GTATACACGTGGTGGGTGACCCCAAAGTGGGACACGCCACCTCCGCCACCCCTGTTTCCA
a M C T T H W G F T L C G G G G G D K G -
GGAGGCGGTGGGGACAAACTCACACATGTCCACCTTGCCCAGCACCTGAACTCCTGGGG
61+.....+.....+.....+.....+.....+.....+ 120
CCTCCGCCACCCCTGTTTTGAGTGTGTACAGGTGGAACGGGTCTGGACTTGAGGACCCC
a G G G G D K T H T C P P C P A P E L L G -
GGACCGTCAGTTTTCTCTTCCCCCAAACCCAAGGACACCCTCATGATCTCCCGGACC
121+.....+.....+.....+.....+.....+.....+ 180
CCTGGCAGTCAAAGGAGAAGGGGGGTTTGGGTTCTGTGGGAGTACTAGAGGGCCTGG
a G P S V F L F P P K P K D T L M I S R T -
CCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAAC
181+.....+.....+.....+.....+.....+.....+ 240
GGACTCCAGTGTACGCACCACCACCTGCACTCGGTGCTTCTGGGACTCCAGTTCAAGTTG
a P E V T C V V V D V S H E D P E V K F N -
TGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTAC
241+.....+.....+.....+.....+.....+.....+ 300
ACCATGCACCTGCCGCACCTCCACGTATTACGGTTCTGTTTCGGCGCCCTCCTCGTCATG
a W Y V D G V E V H N A K T K P R E E Q Y -
AACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGC
301+.....+.....+.....+.....+.....+.....+ 360
TTGTCGTGCATGGCACACCAGTCGCAGGAGTGGCAGGACGTGGTCCTGACCGACTTACCG
a N S T Y R V V S V L T V L H Q D W L N G -
AAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATC
361+.....+.....+.....+.....+.....+.....+ 420
TTCCTCATGTTACGTTCCAGAGGTTGTTTCGGGAGGGTTCGGGGGTAGCTCTTTTGGTAG
a K E Y K C K V S N K A L P A P I E K T I -
TCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAT
421+.....+.....+.....+.....+.....+.....+ 480
AGGTTTCGGTTTCCCGTCGGGGCTCTTGGTGTCCACATGTGGGACGGGGGTAGGGCCCTA
a S K A K G Q P R E P Q V Y T L P P S R D -
GAGCTGACCAAGAACCAGGTGAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGAC
481+.....+.....+.....+.....+.....+.....+ 540
CTCGACTGGTTCTTGGTCCAGTCGGAAGTGGACGGACCAAGATAGGGTCGCTG
a E L T K N Q V S L T C L V K G F Y P S D -
ATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACACTACAAGACCACGCCTCCC
541+.....+.....+.....+.....+.....+.....+ 600
TAGCGGCACCTCACCTCTCGTTACCCGTCGGCCTCTTGTGATGTTCTGGTGCAGGAGGG
a I A V E W E S N G Q P E N N Y K T T P P -

FIG. 26B

601 GTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGG 660
-----+-----+-----+-----+-----+-----+
CACGACCTGAGGCTGCCGAGGAAGAAGGAGATGTCGTTTCGAGTGGCACCTGTTCTCGTCC
a V L D S D G S F F L Y S K L T V D K S R -
TGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTAC
661 -----+-----+-----+-----+-----+-----+ 720
ACCGTCGTCCCCTTGCAGAAGAGTACGAGGCACTACGTACTCCGAGACGTGTTGGTGATG
a W Q Q G N V F S C S V M H E A L H N H Y -
BamHI
|
ACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAATGGATCC
721 -----+-----+-----+-----+-----+-----+ 763
TGCGTCTTCTCGGAGAGGGACAGAGGCCCATTTATTACCTAGG
a T Q K S L S L S P G K *

SEQUENCE LISTING

<110> LIU, CHUAN-FA

FEIGE, ULRICH

CHEETHAM, JANET

BOONE, THOMAS CHARLES

<120> MODIFIED PEPTIDES AS THERAPEUTIC AGENTS

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<140> NOT YET RECEIVED

<141> 1999-10-22

<150> 60/105,371

<151> 1998-10-23

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<170> PatentIn Ver. 2.1

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ggg	gga	ccg	tca	gtc	ttc	ctc	ttc	ccc	cca	aaa	ccc	aag	gac	acc	ctc	96
Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	
			20					25					30			

atg	atc	tcc	cgg	acc	cct	gag	gtc	aca	tgc	gtg	gtg	gtg	gac	gtg	agc	144
Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	
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cac	gaa	gac	cct	gag	gtc	aag	ttc	aac	tgg	tac	gtg	gac	ggc	gtg	gag	192
His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	
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gtg	cat	aat	gcc	aag	aca	aag	ccg	cgg	gag	gag	cag	tac	aac	agc	acg	240
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Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr		
65					70					75					80		
tac	cgt	gtg	gtc	agc	gtc	ctc	acc	gtc	ctg	cac	cag	gac	tgg	ctg	aat	288	
Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn		
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ggc	aag	gag	tac	aag	tgc	aag	gtc	tcc	aac	aaa	gcc	ctc	cca	gcc	ccc	336	
Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro		
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Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln		
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gtg	tac	acc	ctg	ccc	cca	tcc	cgg	gat	gag	ctg	acc	aag	aac	cag	gtc	432	
Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val		
	130					135					140						
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Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val		
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Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro		
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ccc	gtg	ctg	gac	tcc	gac	ggc	tcc	ttc	ttc	ctc	tac	agc	aag	ctc	acc	576	
Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr		
			180					185					190				
gtg	gac	aag	agc	agg	tgg	cag	cag	ggg	aac	gtc	ttc	tca	tgc	tcc	gtg	624	
Val	Asp	Lys	Ser	Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val		
		195					200					205					
atg	cat	gag	gct	ctg	cac	aac	cac	tac	acg	cag	aag	agc	ctc	tcc	ctg	672	
Met	His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu		
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Ser	Pro	Gly	Lys														
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<213> HUMAN

<400> 2

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Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
      35              40              45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
      50              55              60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
      65              70              75              80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
      85              90              95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
      100              105              110

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
      115              120              125

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
      130              135              140

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
      145              150              155              160

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
      165              170              175

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
      180              185              190

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
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Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
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Ser Pro Gly Lys
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PEGYLATED
PEPTIDE

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Arg Ala

<210> 4
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PEGYLATED
PEPTIDE

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Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala
1 5 10 15

Arg Ala

<210> 5
<211> 794
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Fc-TMP

<220>
<221> CDS
<222> (39)..(779)

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Met Asp Lys Thr His Thr

1

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Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe

10

15

20

ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct 152
Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro

25

30

35

gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc 200
Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

40

45

50

aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca 248
Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr

55

60

65

70

aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc 296
Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val

75

80

85

ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc 344
Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys

90

95

100

aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc 392
Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser

105

110

115

aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca 440
Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro

120

125

130

tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc 488
Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val

135

140

145

150

aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg 536
Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly

155

160

165

cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac 584
Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp

170	175	180	
ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg			632
Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp			
185	190	195	
cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac			680
Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His			
200	205	210	
aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa ggt gga			728
Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly			
215	220	225	230
ggt ggt ggt atc gaa ggt ccg act ctg cgt cag tgg ctg gct gct cgt			776
Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg			
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Ala			

<210> 6

<211> 247

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TMP

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Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro

100	105	110
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln		
115	120	125
Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val		
130	135	140
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val		
145	150	155
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro		
165	170	175
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr		
180	185	190
Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val		
195	200	205
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu		
210	215	220
Ser Pro Gly Lys Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg		
225	230	235
Gln Trp Leu Ala Ala Arg Ala		
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<210> 7

<211> 861

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP-TMP

<220>

<221> CDS

<222> (39) .. (842)

<400> 7

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Met Asp Lys Thr His Thr

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Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe	
10 15 20	
ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct	152
Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro	
25 30 35	
gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc	200
Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val	
40 45 50	
aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca	248
Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr	
55 60 65 70	
aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc	296
Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val	
75 80 85	
ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc	344
Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys	
90 95 100	
aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc	392
Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser	
105 110 115	
aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca	440
Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro	
120 125 130	
tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc	488
Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val	
135 140 145 150	
aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg	536
Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly	
155 160 165	
cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac	584
Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp	
170 175 180	
ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg	632
Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp	
185 190 195	

cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac 680
 Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 200 205 210

aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa ggt gga 728
 Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly
 215 220 225 230

ggt ggt ggt atc gaa ggt ccg act ctg cgt cag tgg ctg gct gct cgt 776
 Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg
 235 240 245

gct ggt ggt gga ggt ggc ggc gga ggt att gag ggc cca acc ctt cgc 824
 Ala Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg
 250 255 260

caa tgg ctt gca gca cgc gcataatctc gaggatccg 861
 Gln Trp Leu Ala Ala Arg
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<210> 8

<211> 268

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TMP-TMP

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Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
 35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
 100 105 110

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
 115 120 125
 Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
 130 135 140
 Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
 145 150 155 160
 Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
 165 170 175
 Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
 180 185 190
 Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
 195 200 205
 Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
 210 215 220
 Ser Pro Gly Lys Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg
 225 230 235 240
 Gln Trp Leu Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Gly Ile
 245 250 255
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 260 265

<210> 9

<211> 855

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TMP-TMP-Fc

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<221> CDS

<222> (39)..(845)

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Leu	Arg	Gln	Trp	Leu	Ala	Ala	Arg	Ala	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly						
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ggc	att	gag	ggc	cca	acc	ctt	cgc	caa	tgg	ctt	gca	gca	cgc	gca	ggg	152						
Gly	Ile	Glu	Gly	Pro	Thr	Leu	Arg	Gln	Trp	Leu	Ala	Ala	Arg	Ala	Gly							
				25					30					35								
gga	ggc	ggg	ggg	gac	aaa	act	cac	aca	tgt	cca	cct	tgc	cca	gca	cct	200						
Gly	Gly	Gly	Gly	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro							
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gaa	ctc	ctg	ggg	gga	ccg	tca	gtt	ttc	ctc	ttc	ccc	cca	aaa	ccc	aag	248						
Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys							
55					60					65					70							
gac	acc	ctc	atg	atc	tcc	cgg	acc	cct	gag	gtc	aca	tgc	gtg	gtg	gtg	296						
Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val							
				75					80					85								
gac	gtg	agc	cac	gaa	gac	cct	gag	gtc	aag	ttc	aac	tgg	tac	gtg	gac	344						
Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp							
				90					95					100								
ggc	gtg	gag	gtg	cat	aat	gcc	aag	aca	aag	ccg	cgg	gag	gag	cag	tac	392						
Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr							
				105					110					115								
aac	agc	acg	tac	cgt	gtg	gtc	agc	gtc	ctc	acc	gtc	ctg	cac	cag	gac	440						
Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp							
				120					125					130								
tgg	ctg	aat	ggc	aag	gag	tac	aag	tgc	aag	gtc	tcc	aac	aaa	gcc	ctc	488						
Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu							
135					140					145					150							
cca	gcc	ccc	atc	gag	aaa	acc	atc	tcc	aaa	gcc	aaa	ggg	cag	ccc	cga	536						
Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg							
				155					160					165								
gaa	cca	cag	gtg	tac	acc	ctg	ccc	cca	tcc	cgg	gat	gag	ctg	acc	aag	584						
Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys							
				170					175					180								
aac	cag	gtc	agc	ctg	acc	tgc	ctg	gtc	aaa	ggc	ttc	tat	ccc	agc	gac	632						
Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp							

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Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys			
200	205	210	
acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc			728
Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser			
215	220	225	230
aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca			776
Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser			
	235	240	245
tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc			824
Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser			
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Leu Ser Leu Ser Pro Gly Lys			
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<210> 10

<211> 269

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:TMP-TMP-Fc

<400> 10

Met Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly

1

5

10

15

Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp

20

25

30

Leu Ala Ala Arg Ala Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys

35

40

45

Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu

50

55

60

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu

65

70

75

80

Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys

85

90

95

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
 100 105 110
 Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu
 115 120 125
 Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
 130 135 140
 Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys
 145 150 155 160
 Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
 165 170 175
 Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
 180 185 190
 Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
 195 200 205
 Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
 210 215 220
 Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
 225 230 235 240
 Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
 245 250 255
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 260 265

<210> 11

<211> 789

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<220>

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<220>

<221> CDS

<222> (39)..(779)

<400> 11

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Met Ile Glu Gly Pro Thr
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Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly Gly Gly Gly Asp Lys
10 15 20

act cac aca tgt cca cct tgc cca gca cct gaa ctc ctg ggg gga ccg 152
Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro
25 30 35

tca gtt ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc 200
Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
40 45 50

cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac 248
Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
55 60 65 70

cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat 296
Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
75 80 85

gcc aag aca aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg 344
Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
90 95 100

gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag 392
Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
105 110 115

tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa 440
Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys
120 125 130

acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc 488
Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
135 140 145 150

ctg ccc cca tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc 536
Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr
155 160 165

tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag 584
Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
170 175 180

agc aat ggg cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg 632
 Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
 185 190 195

gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag 680
 Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
 200 205 210

agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag 728
 Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu
 215 220 225 230

gct ctg cac aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt 776
 Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
 235 240 245

aaa taatggatcc 789
 Lys

<210> 12

<211> 247

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:TMP-Fc

<400> 12

Met Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly
 1 5 10 15

Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
 20 25 30

Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
 35 40 45

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
 50 55 60

Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
 65 70 75 80

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
 85 90 95

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
 100 105 110

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
 115 120 125
 Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
 130 135 140
 Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
 145 150 155 160
 Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
 165 170 175
 Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
 180 185 190
 Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
 195 200 205
 Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
 210 215 220
 Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
 225 230 235 240
 Leu Ser Leu Ser Pro Gly Lys
 245

<210> 13

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TMP

<400> 13

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 1 5 10

<210> 14

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TMP-TMP

<400> 14

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
 20 25 30

Ala Ala Arg Ala
 35

<210> 15

<211> 812

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP

<220>

<221> CDS

<222> (39)..(797)

<400> 15

tctagatttg ttttaactaa ttaaaggagg aataacat atg gac aaa act cac aca 56
 Met Asp Lys Thr His Thr
 1 5

tgt cca cct tgt cca gct ccg gaa ctc ctg ggg gga ccg tca gtc ttc 104
 Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 10 15 20

ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct 152
 Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 25 30 35

gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc 200
 Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 40 45 50

aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca 248
 Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 55 60 65 70

aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc 296
Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
75 80 85

ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc 344
Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
90 95 100

aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc 392
Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
105 110 115

aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca 440
Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
120 125 130

tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc 488
Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
135 140 145 150

aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg 536
Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
155 160 165

cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac 584
Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
170 175 180

ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg 632
Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
185 190 195

cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac 680
Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
200 205 210

aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa ggt gga 728
Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly
215 220 225 230

ggt ggt ggt gga ggt act tac tct tgc cac ttc ggc ccg ctg act tgg 776
Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp
235 240 245

gtt tgc aaa ccg cag ggt ggt taatctcgtg gatcc 812
Val Cys Lys Pro Gln Gly Gly
250

<210> 16

<211> 253

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-EMP

<400> 16

Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
 1 5 10 15

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
 35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
 100 105 110

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
 115 120 125

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
 130 135 140

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
 145 150 155 160

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
 165 170 175

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
 180 185 190

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
 195 200 205

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu

20

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
 90 95 100

aac agc acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac 392
 Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
 105 110 115

tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc 440
 Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
 120 125 130

cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga 488
 Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
 135 140 145 150

gaa cca cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag 536
 Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
 155 160 165

aac cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac 584
 Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
 170 175 180

atc gcc gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag 632
 Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
 185 190 195

acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc 680
 Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
 200 205 210

aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca 728
 Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
 215 220 225 230

tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc 776
 Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
 235 240 245

ctc tcc ctg tct ccg ggt aaa taatggatcc 807
 Leu Ser Leu Ser Pro Gly Lys
 250

<210> 18

<211> 253

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:EMP-Fc

<400> 18

Met Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys
1 5 10 15

Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys
20 25 30

Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu
35 40 45

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu
50 55 60

Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys
65 70 75 80

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
85 90 95

Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu
100 105 110

Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
115 120 125

Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys
130 135 140

Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
145 150 155 160

Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
165 170 175

Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
180 185 190

Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
195 200 205

Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
210 215 220

Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
225 230 235 240

His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 245 250

<210> 19
 <211> 881
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:EMP-EMP-Fc

<220>
 <221> CDS
 <222> (41)..(871)

<400> 19
 tctagatttg agttttaact tttagaagga ggaataaaat atg gga ggt act tac 55
 Met Gly Gly Thr Tyr
 1 5

tct tgc cac ttc ggc cca ctg act tgg gtt tgc aaa ccg cag ggt ggc 103
 Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly
 10 15 20

ggc ggc ggc ggc ggt ggt acc tat tcc tgt cat ttt ggc ccg ctg acc 151
 Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr
 25 30 35

tgg gta tgt aag cca caa ggg ggt ggg gga ggc ggg ggg gac aaa act 199
 Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Asp Lys Thr
 40 45 50

cac aca tgt cca cct tgc cca gca cct gaa ctc ctg ggg gga ccg tca 247
 His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
 55 60 65

gtt ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg 295
 Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
 70 75 80 85

acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct 343
 Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
 90 95 100

gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc 391
 Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala

105	110	115	
aag aca aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc			439
Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val			
120	125	130	
agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac			487
Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr			
135	140	145	
aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc			535
Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr			
150	155	160	165
atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg			583
Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu			
170	175	180	
ccc cca tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc			631
Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys			
185	190	195	
ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc			679
Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser			
200	205	210	
aat ggg cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac			727
Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp			
215	220	225	
tcc gac ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc			775
Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser			
230	235	240	245
agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct			823
Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala			
250	255	260	
ctg cac aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa			871
Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys			
265	270	275	
taatggatcc			881

<210> 20

<211> 277

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:EMP-EMP-Fc

<400> 20

Met Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys
 1 5 10 15

Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His
 20 25 30

Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly
 35 40 45

Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 50 55 60

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 65 70 75 80

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 85 90 95

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 100 105 110

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 115 120 125

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 130 135 140

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 145 150 155 160

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 165 170 175

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 180 185 190

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 195 200 205

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 210 215 220

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 225 230 235 240

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 245 250 255

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 260 265 270

Leu Ser Pro Gly Lys
 275

<210> 21

<211> 884

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP-EMP

<220>

<221> CDS

<222> (39)..(869)

<400> 21

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 Met Asp Lys Thr His Thr
 1 5

tgt cca cct tgc cca gca cct gaa ctc ctg ggg gga ccg tca gtt ttc 104
 Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 10 15 20

ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct 152
 Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 25 30 35

gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc 200
 Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 40 45 50

aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca 248
 Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 55 60 65 70

aag ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc 296
 Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 75 80 85

ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc	344
Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys	
90 95 100	
aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc	392
Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser	
105 110 115	
aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg cct cca	440
Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro	
120 125 130	
tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc	488
Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val	
135 140 145 150	
aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg	536
Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly	
155 160 165	
cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac	584
Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp	
170 175 180	
ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg	632
Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp	
185 190 195	
cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac	680
Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His	
200 205 210	
aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa ggt gga	728
Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly	
215 220 225 230	
ggt ggt ggc gga ggt act tac tct tgc cac ttc ggc cca ctg act tgg	776
Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp	
235 240 245	
gtt tgc aaa ccg cag ggt ggc ggc ggc ggc ggc ggt ggt acc tat tcc	824
Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser	
250 255 260	
tgt cat ttt ggc ccg ctg acc tgg gta tgt aag cca caa ggg ggt	869
Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly	
265 270 275	

taatctcgag gatcc

884

<210> 22

<211> 277

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-EMP-EMP

<400> 22

Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
 1 5 10 15

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
 35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
 100 105 110

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
 115 120 125

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
 130 135 140

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
 145 150 155 160

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
 165 170 175

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
 180 185 190

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val

195	200	205
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu		
210	215	220
Ser Pro Gly Lys Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His		
225	230	235 240
Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly		
245	250	255
Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys		
260	265	270
Lys Pro Gln Gly Gly		
275		

<210> 23

<211> 1545

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:pAMG216

<400> 23

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tcctgagtag gacaaatccg ccgggagcgg atttgaacgt tgcgaagcaa cggcccggag 180
ggtggcgggc aggacgcccg ccataaactg ccaggcatca aattaagcag aaggccatcc 240
tgacggatgg ccttttttgcg tttctacaaa ctcttttgtt tatttttcta aatacattca 300
aatatggacg tcgtacttaa cttttaaaagt atgggcaatc aattgctcct gttaaaattg 360
ctttagaaat actttggcag cggtttgttg tattgagttt catttgcgca ttggttaaat 420
ggaaagtgac cgtgcgctta ctacagccta atatttttga aatatcccaa gagctttttc 480
cttcgcatgc ccacgctaaa cattcttttt ctcttttggg taaatcgttg ttgatttat 540
tatttgctat atttattttt cgataattat caactagaga aggaacaatt aatggtatgt 600
tcatacacgc atgtaaaaat aaactatcta tatagttgtc tttctctgaa tgtgcaaaac 660
taagcattcc gaagccatta ttagcagtat gaataggga actaaaccca gtgataagac 720
ctgatgattt cgcttcttta attacatttg gagatttttt atttacagca ttgttttcaa 780
atatattcca attaatcggg gaatgattgg agttagaata atctactata ggatcatatt 840
ttattaaatt agcgtcatca taatattgcc tccatttttt agggtaatta tccagaattg 900
aaatatcaga ttttaaccata gaatgaggat aaatgatcgc gagtaaataa tattcacaat 960
gtaccatttt agtcatatca gataagcatt gattaatatc attattgctt ctacaggctt 1020
taattttatt aattattctg taagtgtcgt cggcatttat gtctttcata cccatctctt 1080
tattccttacc tattgtttgt cgcaagtttt gcgtgttata tatcattaaa acggtaatag 1140
attgacattt gattctaata aattggattt ttgtcacact attatatcgc ttgaaataca 1200

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attgtttaac ataagtacct gtaggatcgt acaggtttac gcaagaaaat ggtttggttat 1260
 agtcgattaa tcgatttgat tctagatttg ttttaactaa ttaaaggagg aataacatat 1320
 ggттаacgсg ttggaattcg agctcactag tgtcgacctg cagggtacca tggaagctta 1380
 ctcgaggatc cgcggaaaga agaagaagaa gaagaaagcc cgaaaggaag ctgagttggc 1440
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<210> 24

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<400> 24

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Lys Ala

1

5

10

<210> 25

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<400> 25

Ile Glu Gly Pro Thr Leu Arg Glu Trp Leu Ala Ala Arg Ala

1

5

10

<210> 26

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 15, Xaa=a linker sequence of 1 to 20 amino acids

<400> 26

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Xaa Ile
1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
20 25

<210> 27

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC PEPTIDE

<220>

<223> At position 15, Xaa=a linker sequence of 1 to 20 amino acids

<400> 27

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Lys Ala Xaa Ile
1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Lys Ala
20 25

<210> 28

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC PEPTIDE

<220>

<223> At position 9 disulfide linkage with residue 24

<220>

<223> At position 24 disulfide linkage with residue 9

<400> 28

Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala Xaa Ile
 1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala
 20 25

<210> 29

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 16 bromoacetyl group linked to
 sidechain

<400> 29

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Xaa Lys
 1 5 10 15

Xaa Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25 30

<210> 30

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 16 polyethylene glycol linked to
 sidechain

<400> 30

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Xaa Lys
 1 5 10 15

Xaa Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25 30

<210> 31

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 9 disulfide bond to residue 9 of a
 separate identical sequence

<400> 31

Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala Xaa Ile
 1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25

<210> 32

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 24 disulfide bond to residue 9 of a
 separate identical sequence

<400> 32

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Xaa Ile
 1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala
 20 25

<210> 33

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 33

Val Arg Asp Gln Ile Xaa Xaa Xaa Leu

1

5

<210> 34

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 34

Thr Leu Arg Glu Trp Leu

1

5

<210> 35

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 35

Gly Arg Val Arg Asp Gln Val Ala Gly Trp

1

5

10

<210> 36

<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 36
Gly Arg Val Lys Asp Gln Ile Ala Gln Leu
1 5 10

<210> 37
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Description of
Artificial SequenceTPO-MIMETIC PEPTIDE

<400> 37
Gly Val Arg Asp Gln Val Ser Trp Ala Leu
1 5 10

<210> 38
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 38
Glu Ser Val Arg Glu Gln Val Met Lys Tyr
1 5 10

<210> 39
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 39

Ser Val Arg Ser Gln Ile Ser Ala Ser Leu
1 5 10

<210> 40

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 40

Gly Val Arg Glu Thr Val Tyr Arg His Met
1 5 10

<210> 41

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 41

Gly Val Arg Glu Val Ile Val Met His Met Leu
1 5 10

<210> 42

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

PEPTIDE

<400> 42

Gly Arg Val Arg Asp Gln Ile Trp Ala Ala Leu
1 5 10

<210> 43

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 43

Ala Gly Val Arg Asp Gln Ile Leu Ile Trp Leu
1 5 10

<210> 44

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 44

Gly Arg Val Arg Asp Gln Ile Met Leu Ser Leu
1 5 10

<210> 45

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 45

Gly Arg Val Arg Asp Gln Ile Xaa Xaa Xaa Leu
1 5 10

<210> 46

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 46

Cys Thr Leu Arg Gln Trp Leu Gln Gly Cys
1 5 10

<210> 47

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 47

Cys Thr Leu Gln Glu Phe Leu Glu Gly Cys
1 5 10

<210> 48

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 48

Cys Thr Arg Thr Glu Trp Leu His Gly Cys
1 5 10

<210> 49
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 49

Cys Thr Leu Arg Glu Trp Leu His Gly Gly Phe Cys
1 5 10

<210> 50

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 50

Cys Thr Leu Arg Glu Trp Val Phe Ala Gly Leu Cys
1 5 10

<210> 51

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 51

Cys Thr Leu Arg Gln Trp Leu Ile Leu Leu Gly Met Cys
1 5 10

<210> 52

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 52

Cys Thr Leu Ala Glu Phe Leu Ala Ser Gly Val Glu Gln Cys
1 5 10

<210> 53

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 53

Cys Ser Leu Gln Glu Phe Leu Ser His Gly Gly Tyr Val Cys
1 5 10

<210> 54

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 54

Cys Thr Leu Arg Glu Phe Leu Asp Pro Thr Thr Ala Val Cys
1 5 10

<210> 55

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 55

Cys Thr Leu Lys Glu Trp Leu Val Ser His Glu Val Trp Cys
1 5 10

<210> 56

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 56

Cys Thr Leu Arg Glu Trp Leu Xaa Xaa Cys
1 5 10

<210> 57

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 57

Cys Thr Leu Arg Glu Trp Leu Xaa Xaa Xaa Cys
1 5 10

<210> 58

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 58

Cys Thr Leu Arg Glu Trp Leu Xaa Xaa Xaa Xaa Cys

1

5

10

<210> 59

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 59

Cys Thr Leu Arg Glu Trp Leu Xaa Xaa Xaa Xaa Xaa Cys

1

5

10

<210> 60

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 60

Cys Thr Leu Arg Glu Trp Leu Xaa Xaa Xaa Xaa Xaa Xaa Cys

1

5

10

<210> 61

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 61

Arg Glu Gly Pro Thr Leu Arg Gln Trp Met

1

5

10

<210> 62
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 62
Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala
1 5 10

<210> 63
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 63
Glu Arg Gly Pro Phe Trp Ala Lys Ala Cys
1 5 10

<210> 64
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 64
Arg Glu Gly Pro Arg Cys Val Met Trp Met
1 5 10

<210> 65
<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 65

Cys Gly Thr Glu Gly Pro Thr Leu Ser Thr Trp Leu Asp Cys
1 5 10

<210> 66

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 66

Cys Glu Gln Asp Gly Pro Thr Leu Leu Glu Trp Leu Lys Cys
1 5 10

<210> 67

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 67

Cys Glu Leu Val Gly Pro Ser Leu Met Ser Trp Leu Thr Cys
1 5 10

<210> 68

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 68

Cys Leu Thr Gly Pro Phe Val Thr Gln Trp Leu Tyr Glu Cys
1 5 10

<210> 69

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 69

Cys Arg Ala Gly Pro Thr Leu Leu Glu Trp Leu Thr Leu Cys
1 5 10

<210> 70

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 70

Cys Ala Asp Gly Pro Thr Leu Arg Glu Trp Ile Ser Phe Cys
1 5 10

<210> 71

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 71

Cys Xaa Glu Gly Pro Thr Leu Arg Glu Trp Leu Xaa Cys
1 5 10

<210> 72

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 72

Cys Xaa Xaa Glu Gly Pro Thr Leu Arg Glu Trp Leu Xaa Cys
1 5 10

<210> 73

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 73

Cys Xaa Glu Gly Pro Thr Leu Arg Glu Trp Leu Xaa Xaa Cys
1 5 10

<210> 74

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 74

Cys Xaa Xaa Glu Gly Pro Thr Leu Arg Glu Trp Leu Xaa Xaa Cys

1

5

10

15

<210> 75

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 75

Gly Gly Cys Thr Leu Arg Glu Trp Leu His Gly Gly Phe Cys Gly Gly

1

5

10

15

<210> 76

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 76

Gly Gly Cys Ala Asp Gly Pro Thr Leu Arg Glu Trp Ile Ser Phe Cys

1

5

10

15

Gly Gly

<210> 77

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 77

Gly Asn Ala Asp Gly Pro Thr Leu Arg Gln Trp Leu Glu Gly Arg Arg

1

5

10

15

Pro Lys Asn

<210> 78

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 78

Leu Ala Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu His Gly Asn Gly
1 5 10 15

Arg Asp Thr

<210> 79

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 79

His Gly Arg Val Gly Pro Thr Leu Arg Glu Trp Lys Thr Gln Val Ala
1 5 10 15

Thr Lys Lys

<210> 80

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 80

Thr Ile Lys Gly Pro Thr Leu Arg Gln Trp Leu Lys Ser Arg Glu His
1 5 10 15

Thr Ser

<210> 81

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 81

Ile Ser Asp Gly Pro Thr Leu Lys Glu Trp Leu Ser Val Thr Arg Gly
1 5 10 15

Ala Ser

<210> 82

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 82

Ser Ile Glu Gly Pro Thr Leu Arg Glu Trp Leu Thr Ser Arg Thr Pro
1 5 10 15

His Ser

<210> 83
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 83
Tyr Xaa Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro
1 5 10

<210> 84
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 84
Tyr Xaa Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro Tyr Xaa
1 5 10 15

Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro
20 25

<210> 85
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>
<223> At position 15, Xaa=a linker sequence of 1 to 20
amino acids

<400> 85

Tyr Xaa Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro Xaa Tyr
 1 5 10 15

Xaa Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro
 20 25

<210> 86

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
 PEPTIDE

<220>

<223> At position 15. linked through epsilon amine to
 lysyl, which is linked to a separate identical
 sequence through that sequence's alpha amine

<400> 86

Tyr Xaa Cys Xaa Xaa Gly Pro Xaa Thr Trp Xaa Cys Xaa Pro
 1 5 10

<210> 87

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
 PEPTIDE

<400> 87

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
 1 5 10 15

Pro Gln Gly Gly
 20

<210> 88

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 88

Gly	Gly	Asp	Tyr	His	Cys	Arg	Met	Gly	Pro	Leu	Thr	Trp	Val	Cys	Lys
1				5				10					15		

Pro	Leu	Gly	Gly
			20

<210> 89

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 89

Gly	Gly	Val	Tyr	Ala	Cys	Arg	Met	Gly	Pro	Ile	Thr	Trp	Val	Cys	Ser
1				5				10					15		

Pro	Leu	Gly	Gly
			20

<210> 90

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 90

Val	Gly	Asn	Tyr	Met	Cys	His	Phe	Gly	Pro	Ile	Thr	Trp	Val	Cys	Arg
1				5				10					15		

Pro	Gly	Gly	Gly
-----	-----	-----	-----

20

<210> 91

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 91

Gly Gly Leu Tyr Leu Cys Arg Phe Gly Pro Val Thr Trp Asp Cys Gly
1 5 10 15Tyr Lys Gly Gly
20

<210> 92

<211> 40

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 92

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15Pro Gln Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr
20 25 30Trp Val Cys Lys Pro Gln Gly Gly
35 40

<210> 93

<211> 41

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 21, Xaa=a linker sequence of 1 to 20
amino acids

<400> 93

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Gln Gly Gly Xaa Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu
20 25 30

Thr Trp Val Cys Lys Pro Gln Gly Gly
35 40

<210> 94

<211> 23

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 94

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Gln Gly Gly Ser Ser Lys
20

<210> 95

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDE

<400> 95

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
 1 5 10 15
 Pro Gln Gly Gly Ser Ser Lys Gly Gly Thr Tyr Ser Cys His Phe Gly
 20 25 30
 Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Ser Ser Lys
 35 40 45

<210> 96

<211> 47

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDE

<220>

<223> At position 24, Xaa=a linker sequence of 1 to 20
 amino acids

<400> 96

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
 1 5 10 15
 Pro Gln Gly Gly Ser Ser Lys Xaa Gly Gly Thr Tyr Ser Cys His Phe
 20 25 30
 Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Ser Ser Lys
 35 40 45

<210> 97

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
 PEPTIDE

<220>

<223> At position 22 linked through epsilon amine to
 lysyl, which is linked to a separate identical

sequence through that sequence's alpha amine

<400> 97

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Gln Gly Gly Ser Ser
20

<210> 98

<211> 23

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 23 biotin linked to the sidechain
through a linker

<400> 98

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Gln Gly Gly Ser Ser Lys
20

<210> 99

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:G-CSF MIMETIC
PEPTIDE

<220>

<223> At position 4 disulfide bond to residue 4 of a
separate identical sequence

<400> 99

Glu Glu Asp Cys Lys

1

5

<210> 100

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:G-CSF MIMETIC
PEPTIDE

<220>

<223> At position 4, Xaa is an isoteric ethylene spacer
linked to a separate identical sequence

<400> 100

Glu Glu Asp Xaa Lys

1

5

<210> 101

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:G-CSF MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is a pyroglutamic acid residue

<220>

<223> At position 4, Xaa is an isoteric ethylene spacer
linked to a separate identical sequence

<400> 101

Xaa Glu Asp Xaa Lys

1

5

<210> 102

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is a picolinic acid residue

<220>

<223> At position 4, Xaa is an isoteric ethylene spacer
linked to a separate identical sequence

<400> 102

Xaa Ser Asp Xaa Lys

1

5

<210> 103

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 6, Xaa=a linker sequence of 1 to 20
amino acids

<400> 103

Glu Glu Asp Cys Lys Xaa Glu Glu Asp Cys Lys

1

5

10

<210> 104

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 6, Xaa=a linker sequence of 1 to 20
amino acids

<400> 104

Glu Glu Asp Xaa Lys Xaa Glu Glu Asp Xaa Lys
1 5 10

<210> 105

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ANTIVIRAL (HBV)
PEPTIDE

<400> 105

Leu Leu Gly Arg Met Lys
1 5

<210> 106

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 106

Tyr Cys Phe Thr Ala Ser Glu Asn His Cys Tyr
1 5 10

<210> 107

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 107

Tyr Cys Phe Thr Asn Ser Glu Asn His Cys Tyr
1 5 10

<210> 108

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 108

Tyr Cys Phe Thr Arg Ser Glu Asn His Cys Tyr
1 5 10

<210> 109

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 109

Phe Cys Ala Ser Glu Asn His Cys Tyr
1 5

<210> 110

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONSIT
PEPTIDE

<400> 110

Tyr Cys Ala Ser Glu Asn His Cys Tyr
1 5

<210> 111
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 111
Phe Cys Asn Ser Glu Asn His Cys Tyr
1 5

<210> 112
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 112
Phe Cys Asn Ser Glu Asn Arg Cys Tyr
1 5

<210> 113
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 113
Phe Cys Asn Ser Val Glu Asn Arg Cys Tyr
1 5 10

<210> 114
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 114
Tyr Cys Ser Gln Ser Val Ser Asn Asp Cys Phe
1 5 10

<210> 115
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 115
Phe Cys Val Ser Asn Asp Arg Cys Tyr
1 5

<210> 116
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 116
Tyr Cys Arg Lys Glu Leu Gly Gln Val Cys Tyr
1 5 10

<210> 117
<211> 9
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 117

Tyr Cys Lys Glu Pro Gly Gln Cys Tyr

1

5

<210> 118

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 118

Tyr Cys Arg Lys Glu Met Gly Cys Tyr

1

5

<210> 119

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 119

Phe Cys Arg Lys Glu Met Gly Cys Tyr

1

5

<210> 120

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 120

Tyr Cys Trp Ser Gln Asn Leu Cys Tyr
1 5

<210> 121
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 121
Tyr Cys Glu Leu Ser Gln Tyr Leu Cys Tyr
1 5 10

<210> 122
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 122
Tyr Cys Trp Ser Gln Asn Tyr Cys Tyr
1 5

<210> 123
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TNF-ANTAGONIST

<400> 123
Tyr Cys Trp Ser Gln Tyr Leu Cys Tyr
1 5

<210> 124

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 124

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Pro Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Thr Trp Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30

Xaa Xaa Xaa Xaa Xaa
35

<210> 125

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CTLA4-MIMETIC
PEPTIDE

<400> 125

Gly Phe Val Cys Ser Gly Ile Phe Ala Val Gly Val Gly Arg Cys
1 5 10 15

<210> 126

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CTLA4-MIMETIC
PEPTIDE

<400> 126

Ala Pro Gly Val Arg Leu Gly Cys Ala Val Leu Gly Arg Tyr Cys
1 5 10 15

<210> 127

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C3B ANTAGONIST

<400> 127

Ile Cys Val Val Gln Asp Trp Gly His His Arg Cys Thr Ala Gly His
1 5 10 15

Met Ala Asn Leu Thr Ser His Ala Ser Ala Ile
20 25

<210> 128

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C3B ANTAGONIST
PEPTIDE

<400> 128

Ile Cys Val Val Gln Asp Trp Gly His His Arg Cys Thr
1 5 10

<210> 129

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C3B ANTAGONIST
PEPTIDE

<400> 129

Cys Val Val Gln Asp Trp Gly His His Ala Cys
1 5 10

<210> 130
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 130
Thr Phe Ser Asp Leu Trp
1 5

<210> 131
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 131
Gln Glu Thr Phe Ser Asp Leu Trp Lys Leu Leu Pro
1 5 10

<210> 132
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 132
Gln Pro Thr Phe Ser Asp Leu Trp Lys Leu Leu Pro
1 5 10

<210> 133
<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 133

Gln Glu Thr Phe Ser Asp Tyr Trp Lys Leu Leu Pro
1 5 10

<210> 134

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 134

Gln Pro Thr Phe Ser Asp Tyr Trp Lys Leu Leu Pro
1 5 10

<210> 135

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 135

Met Pro Arg Phe Met Asp Tyr Trp Glu Gly Leu Asn
1 5 10

<210> 136

<211> 12

<212> PRT...

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C3B ANTAGONIST

<400> 136

Val Gln Asn Phe Ile Asp Tyr Trp Thr Gln Gln Phe
1 5 10

<210> 137

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 137

Thr Gly Pro Ala Phe Thr His Tyr Trp Ala Thr Phe
1 5 10

<210> 138

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 138

Ile Asp Arg Ala Pro Thr Phe Arg Asp His Trp Phe Ala Leu Val
1 5 10 15

<210> 139

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 139

Pro Arg Pro Ala Leu Val Phe Ala Asp Tyr Trp Glu Thr Leu Tyr
1 5 10 15

<210> 140

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 140

Pro Ala Phe Ser Arg Phe Trp Ser Asp Leu Ser Ala Gly Ala His
1 5 10 15

<210> 141

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 141

Pro Ala Phe Ser Arg Phe Trp Ser Lys Leu Ser Ala Gly Ala His
1 5 10 15

<210> 142

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 142 ...

Pro Xaa Phe Xaa Asp Tyr Trp Xaa Xaa Leu
1 5 10

<210> 143
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 143
Gln Glu Thr Phe Ser Asp Leu Trp Lys Leu Leu Pro
1 5 10

<210> 144
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 144
Gln Pro Thr Phe Ser Asp Leu Trp Lys Leu Leu Pro
1 5 10

<210> 145
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 145
Gln Glu Thr Phe Ser Asp Tyr Trp Lys Leu Leu Pro
1 5 10

<210> 146
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 146
Gln Pro Thr Phe Ser Asp Tyr Trp Lys Leu Leu Pro
1 5 10

<210> 147
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 147
Asp Ile Thr Trp Asp Gln Leu Trp Asp Leu Met Lys
1 5 10

<210> 148
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 148
Asp Ile Thr Trp Asp Glu Leu Trp Lys Ile Met Asn
1 5 10

<210> 149
<211> 12
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 149

Asp Tyr Thr Trp Phe Glu Leu Trp Asp Met Met Gln
1 5 10

<210> 150

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 150

Gln Ile Thr Trp Ala Gln Leu Trp Asn Met Met Lys
1 5 10

<210> 151

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 151

Asp Met Thr Trp His Asp Leu Trp Thr Leu Met Ser
1 5 10

<210> 152

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 152

Asp Tyr Ser Trp His Asp Leu Trp Glu Met Met Ser
1 5 10

<210> 153

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 153

Glu Ile Thr Trp Asp Gln Leu Trp Glu Val Met Asn
1 5 10

<210> 154

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MDM/HDM
ANTAGONIST PEPTIDE

<400> 154

His Val Ser Trp Glu Gln Leu Trp Asp Ile Met Asn
1 5 10

<210> 155

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 155

His Ile Thr Trp Asp Gln Leu Trp Arg Ile Met Thr
1 5 10

<210> 156

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 156

Arg Asn Met Ser Trp Leu Glu Leu Trp Glu His Met Lys
1 5 10

<210> 157

<211> 18

<212> PRT

<213> Artificial Sequence.

<220>

<223> Description of Artificial Sequence:SELECTIN

<400> 157

Ala Glu Trp Thr Trp Asp Gln Leu Trp His Val Met Asn Pro Ala Glu
1 5 10 15

Ser Gln

<210> 158

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN

<400> 158

His Arg Ala Glu Trp Leu Ala Leu Trp Glu Gln Met Ser Pro

1 5 10

<210> 159

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SELECTIN
ANTAGONIST PEPTIDE

<400> 159

Lys Lys Glu Asp Trp Leu Ala Leu Trp Arg Ile Met Ser Val
1 5 10

<210> 160

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SELECTIN

<400> 160

Ile Thr Trp Asp Gln Leu Trp Asp Leu Met Lys
1 5 10

<210> 161

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SELECTIN

<400> 161

Asp Ile Thr Trp Asp Gln Leu Trp Asp Leu Met Lys
1 5 10

<210> 162

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SELECTIN

<400> 162
Asp Ile Thr Trp Asp Gln Leu Trp Asp Leu Met Lys
1 5 10

<210> 163
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 163
Asp Ile Thr Trp Asp Gln Leu Trp Asp Leu Met Lys
1 5 10

<210> 164
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 164
Ser Cys Val Lys Trp Gly Lys Lys Glu Phe Cys Gly Ser
1 5 10

<210> 165
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN

<400> 165

Ser	Cys	Trp	Lys	Tyr	Trp	Gly	Lys	Glu	Cys	Gly	Ser
1				5				10			

<210> 166

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 166

Ser	Cys	Tyr	Glu	Trp	Gly	Lys	Leu	Arg	Trp	Cys	Gly	Ser
1				5				10				

<210> 167

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: CALMODULIN
ANTAGONIST PEPTIDE

<400> 167

Ser	Cys	Leu	Arg	Trp	Gly	Lys	Trp	Ser	Asn	Cys	Gly	Ser
1				5				10				

<210> 168

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 168

Ser Cys Trp Arg Trp Gly Lys Tyr Gln Ile Cys Gly Ser
1 5 10

<210> 169

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 169

Ser Cys Val Ser Trp Gly Ala Leu Lys Leu Cys Gly Ser
1 5 10

<210> 170

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 170

Ser Cys Ile Arg Trp Gly Gln Asn Thr Phe Cys Gly Ser
1 5 10

<210> 171

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 171

Ser Cys Trp Gln Trp Gly Asn Leu Lys Ile Cys Gly Ser
1 5 10

<210> 172
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:CALMODULIN
 ANTAGONIST PEPTIDE

<400> 172
 Ser Cys Val Arg Trp Gly Gln Leu Ser Ile Cys Gly Ser
 1 5 10

<210> 173
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:CALMODULIN
 ANTAGONIST PEPTIDE

<400> 173
 Leu Lys Lys Phe Asn Ala Arg Arg Lys Leu Lys Gly Ala Ile Leu Thr
 1 5 10 15

Thr Met Leu Ala Lys
 20

<210> 174
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:CALMODULIN

<400> 174
 Arg Arg Trp Lys Lys Asn Phe Ile Ala Val Ser Ala Ala Asn Arg Phe
 1 5 10 15

Lys Lys

<210> 175
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:CALMODULIN

<400> 175
Arg Lys Trp Gln Lys Thr Gly His Ala Val Arg Ala Ile Gly Arg Leu
1 5 10 15

Ser Ser

<210> 176
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 176
Ile Asn Leu Lys Ala Leu Ala Ala Leu Ala Lys Lys Ile Leu
1 5 10

<210> 177
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 177
Lys Ile Trp Ser Ile Leu Ala Pro Leu Gly Thr Thr Leu Val Lys Leu

1

5

10

15

Val Ala

<210> 178

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 178

Leu Lys Lys Leu Leu Lys Leu Leu Lys Lys Leu Leu Lys Leu
1 5 10

<210> 179

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 179

Leu Lys Trp Lys Lys Leu Leu Lys Leu Leu Lys Lys Leu Leu Lys Lys
1 5 10 15

Leu Leu

<210> 180

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 180

Ala Glu Trp Pro Ser Leu Thr Glu Ile Lys Thr Leu Ser His Phe Ser
1 5 10 15

Val

<210> 181

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 181

Ala Glu Trp Pro Ser Pro Thr Arg Val Ile Ser Thr Thr Tyr Phe Gly
1 5 10 15

Ser

<210> 182

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 182

Ala Glu Leu Ala His Trp Pro Pro Val Lys Thr Val Leu Arg Ser Phe
1 5 10 15

Thr

<210> 183

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 183

Ala	Glu	Gly	Ser	Trp	Leu	Gln	Leu	Leu	Asn	Leu	Met	Lys	Gln	Met	Asn
1				5					10					15	

Asn

<210> 184

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CALMODULIN
ANTAGONIST PEPTIDE

<400> 184

Ala	Glu	Trp	Pro	Ser	Leu	Thr	Glu	Ile	Lys
1				5					10

<210> 185

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:VINCULIN-BINDING PEPTIDE

<400> 185

Ser	Thr	Gly	Gly	Phe	Asp	Asp	Val	Tyr	Asp	Trp	Ala	Arg	Gly	Val	Ser
1				5					10					15	

Ser	Ala	Leu	Thr	Thr	Thr	Leu	Val	Ala	Thr	Arg
						20			25	

<210> 186
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial
Sequence:VINCULIN-BINDING PEPTIDE

<400> 186
Ser Thr Gly Gly Phe Asp Asp Val Tyr Asp Trp Ala Arg Arg Val Ser
1 5 10 15

Ser Ala Leu Thr Thr Thr Leu Val Ala Thr Arg
20 25

<210> 187
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VINCULIN
BINDING PEPTIDE

<400> 187
Ser Arg Gly Val Asn Phe Ser Glu Trp Leu Tyr Asp Met Ser Ala Ala
1 5 10 15

Met Lys Glu Ala Ser Asn Val Phe Pro Ser Arg Arg Ser Arg
20 25 30

<210> 188
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VINCULIN
BINDING PEPTIDE

<400> 188
Ser Ser Gln Asn Trp Asp Met Glu Ala Gly Val Glu Asp Leu Thr Ala

1	5	10	15
Ala	Met	Leu	Gly
	Leu	Leu	Ser
	Thr	Ile	His
	Ser	Ser	Ser
	Arg		
20	25	30	

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<210> 189
<211> 31
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:VINCULIN
BINDING PEPTIDE

<400> 189
Ser Ser Pro Ser Leu Tyr Thr Gln Phe Leu Val Asn Tyr Glu Ser Ala
1 5 10 15

Ala Thr Arg Ile Gln Asp Leu Leu Ile Ala Ser Arg Pro Ser Arg
20 25 30

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<210> 190
<211> 31
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:VINCULIN
BINDING PEPTIDE

<400> 190
Ser Ser Thr Gly Trp Val Asp Leu Leu Gly Ala Leu Gln Arg Ala Ala
1 5 10 15

Asp Ala Thr Arg Thr Ser Ile Pro Pro Ser Leu Gln Asn Ser Arg
20 25 30

```
<210> 191
<211> 18
<212> PRT ...
<213> Artificial Sequence
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<220>

<223> Description of Artificial Sequence:VINCULIN
BINDING PEPTIDE

<400> 191

Asp Val Tyr Thr Lys Lys Glu Leu Ile Glu Cys Ala Arg Arg Val Ser
1 5 10 15

Glu Lys

<210> 192

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C4BP-BINDING
PEPTIDE

<400> 192

Glu Lys Gly Ser Tyr Tyr Pro Gly Ser Gly Ile Ala Gln Phe His Ile
1 5 10 15Asp Tyr Asn Asn Val Ser
20

<210> 193

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:C4BP-BINDING
PEPTIDE

<400> 193

Ser Gly Ile Ala Gln Phe His Ile Asp Tyr Asn Asn Val Ser Ser Ala
1 5 10 15Glu Gly Trp His Val Asn
20

<210> 194
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:C4BP-BINDING
PEPTIDE

<400> 194
Leu Val Thr Val Glu Lys Gly Ser Tyr Tyr Pro Gly Ser Gly Ile Ala
1 5 10 15
Gln Phe His Ile Asp Tyr Asn Asn Val Ser Ser Ala Glu Gly Trp His
20 25 30
Val Asn

<210> 195
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:C4BP-BINDING
PEPTIDE

<400> 195
Ser Gly Ile Ala Gln Phe His Ile Asp Tyr Asn Asn Val Ser
1 5 10

<210> 196
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 196
Ala Glu Pro Met Pro His Ser Leu Asn Phe Ser Gln Tyr Leu Trp Tyr

1

5

10

15

Thr

<210> 197

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 197

Ala Glu His Thr Tyr Ser Ser Leu Trp Asp Thr Tyr Ser Pro Leu Ala
1 5 10 15

Phe

<210> 198

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:VINCULIN-BINDING PEPTIDE

<400> 198

Ala Glu Leu Asp Leu Trp Met Arg His Tyr Pro Leu Ser Phe Ser Asn
1 5 10 15

Arg

<210> 199

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 199

Ala Glu Ser Ser Leu Trp Thr Arg Tyr Ala Trp Pro Ser Met Pro Ser
1 5 10 15

Tyr

<210> 200

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 200

Ala Glu Trp His Pro Gly Leu Ser Phe Gly Ser Tyr Leu Trp Ser Lys
1 5 10 15

Thr

<210> 201

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 201

Ala Glu Pro Ala Leu Leu Asn Trp Ser Phe Phe Phe Asn Pro Gly Leu
1 5 10 15

His

<210> 202
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 202
Ala Glu Trp Ser Phe Tyr Asn Leu His Leu Pro Glu Pro Gln Thr Ile
1 5 10 15

Phe

<210> 203
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 203
Ala Glu Pro Leu Asp Leu Trp Ser Leu Tyr Ser Leu Pro Pro Leu Ala
1 5 10 15

Met

<210> 204
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 204
Ala Glu Pro Thr Leu Trp Gln Leu Tyr Gln Phe Pro Leu Arg Leu Ser

1 5 10 15

Gly

<210> 205

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 205

Ala Glu Ile Ser Phe Ser Glu Leu Met Trp Leu Arg Ser Thr Pro Ala
1 5 10 15

Phe

<210> 206

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 206

Ala Glu Leu Ser Glu Ala Asp Leu Trp Thr Thr Trp Phe Gly Met Gly
1 5 10 15

Ser

<210> 207

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 207

Ala Glu Ser Ser Leu Trp Arg Ile Phe Ser Pro Ser Ala Leu Met Met
1 5 10 15

Ser

<210> 208

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 208

Ala Glu Ser Leu Pro Thr Leu Thr Ser Ile Leu Trp Gly Lys Glu Ser
1 5 10 15

Val

<210> 209

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 209

Ala Glu Thr Leu Phe Met Asp Leu Trp His Asp Lys His Ile Leu Leu
1 5 10 15

Thr

<210> 210
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 210
Ala Glu Ile Leu Asn Phe Pro Leu Trp His Glu Pro Leu Trp Ser Thr
1 5 10 15
Glu

<210> 211
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 211
Ala Glu Ser Gln Thr Gly Thr Leu Asn Thr Leu Phe Trp Asn Thr Leu
1 5 10 15
Arg

<210> 212
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 1, Xaa is V, L, I, E, P, G, Y, M, T,

or D

<220>

<223> At position 2, Xaa is Y, W or F

<220>

<223> At position 3, Xaa is E, F, V, W or Y

<220>

<223> At position 5, Xaa is P or azetidine

<220>

<223> At position 7, Xaa is S, A, V or L

<220>

<223> At position 8, Xaa is M, F, V, R, Q, K, T, S, D,
L, I or E

<220>

<223> At position 9, Xaa is E, L, W, V, H, I, G, A, D,
L, Y, N, Q or P

<400> 212

Xaa Xaa Xaa Gln Xaa Tyr Xaa Xaa Xaa

1

5

<210> 213

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: IL-1 ANTAGONIST
PEPTIDE

<400> 213

Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Tyr Tyr Trp Gln Pro

1

5

10

15

Tyr Ala Leu Pro Leu

20

<210> 214

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 214

Ser	Trp	Thr	Asp	Tyr	Gly	Tyr	Trp	Gln	Pro	Tyr	Ala	Leu	Pro	Ile	Ser
1				5				10						15	

Gly Leu

<210> 215

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 215

Glu	Thr	Pro	Phe	Thr	Trp	Glu	Glu	Ser	Asn	Ala	Tyr	Tyr	Trp	Gln	Pro
1				5					10					15	

Tyr Ala Leu Pro Leu
20

<210> 216

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 216

Glu	Asn	Thr	Tyr	Ser	Pro	Asn	Trp	Ala	Asp	Ser	Met	Tyr	Trp	Gln	Pro
1				5				10						15	

Tyr Ala Leu Pro Leu

20

<210> 217
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 217
Ser Val Gly Glu Asp His Asn Phe Trp Thr Ser Glu Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 218
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 218
Asp Gly Tyr Asp Arg Trp Arg Gln Ser Gly Glu Arg Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 219
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 219

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr
1 5 10

<210> 220

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 220

Phe Glu Trp Thr Pro Gly Tyr Trp Gln His Tyr
1 5 10

<210> 221

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 221

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr
1 5 10

<210> 222

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, optionally acetylated at N-terminus

<220>

<223> At position 10, Xaa=azetidine

<400> 222

Phe	Glu	Trp	Thr	Pro	Gly	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 223

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 11, Xaa=azetidine

<400> 223

Phe	Glu	Trp	Thr	Pro	Gly	Trp	Pro	Tyr	Gln	Xaa	Tyr
1				5					10		

<210> 224

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 224

Phe	Ala	Trp	Thr	Pro	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 225
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa=azetidine

<400> 225
Phe Glu Trp Ala Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 226
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa=azetidine

<400> 226
Phe Glu Trp Val Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 227
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa=azetidine

<400> 227

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 228

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, optionally acetylated at N-terminus

<220>

<223> At position 10, Xaa=azetidine

<400> 228

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 229

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, products="MeGly"

<220>

<223> At position 10, Xaa=azetidine

<400> 229

Phe Glu Trp Thr Pro Xaa Trp Tyr Gln Xaa Tyr
1 5 10

<210> 230
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 6, Xaa=MeGly

<220>
<223> At position 10, Xaa=azetidine

<400> 230
Phe Glu Trp Thr Pro Xaa Trp Tyr Gln Xaa Tyr
1 5 10

<210> 231
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 231
Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Pro Tyr
1 5 10

<210> 232
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 232
Phe Glu Trp Thr Pro Gly Trp Trp Gln Pro Tyr

1 5 10

<210> 233

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 233

Phe Glu Trp Thr Pro Asn Tyr Trp Gln Pro Tyr
1 5 10

<210> 234

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=pipecolic acid

<220>

<223> At position 10, Xaa=azetidine

<400> 234

Phe Glu Trp Thr Xaa Val Tyr Trp Gln Xaa Tyr
1 5 10

<210> 235

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=pipecolic acid

<220>

<223> At position 10, Xaa=azetidine

<400> 235

Phe	Glu	Trp	Thr	Xaa	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 236

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, Xaa=Aib

<220>

<223> At position 10, Xaa=azetidine

<400> 236

Phe	Glu	Trp	Thr	Pro	Xaa	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 237

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=MeGly

<220>

<223> At position 10, Xaa=azetidine

<400> 237

Phe Glu Trp Thr Xaa Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 238

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 11, amino group added at C-terminus

<400> 238

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr
1 5 10

<210> 239

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 11, amino group added at C-terminus

<400> 239

Phe Glu Trp Thr Pro Gly Tyr Trp Gln His Tyr
1 5 10

<210> 240

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 240

Phe	Glu	Trp	Thr	Pro	Gly	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 241

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, optionally acetylated at
N-terminus

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 241

Phe	Glu	Trp	Thr	Pro	Gly	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 242

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

PEPTIDE

<220>

<223> At position 8, Xaa is a phyosphotyrosyl residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 242

Phe Glu Trp Thr Pro Gly Trp Xaa Gln Xaa Tyr

1

5

10

<210> 243

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 243

Phe Ala Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr

1

5

10

<210> 244

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 244

Phe Glu Trp Ala Pro Gly Tyr Trp Gln Xaa Tyr

1

5

10

<210> 245

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 245

Phe Glu Trp Val Pro Gly Tyr Trp Gln Xaa Tyr

1

5

10

<210> 246

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 246

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 247

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1 acetylated at N-terminus

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 247

Xaa Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 248

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 248

Phe Glu Trp Thr Pro Ala Trp Tyr Gln Xaa Tyr
1 5 10

<210> 249

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, Xaa is a sarcosine residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11 amino group added at C-terminus

<400> 249

Phe Glu Trp Thr Pro Xaa Trp Tyr Gln Xaa Tyr
1 5 10

<210> 250

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 11 amino group added at C-terminus

<400> 250

Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Pro Tyr
1 5 10

<210> 251

<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 11 amino group added at C-terminus

<400> 251
Phe Glu Trp Thr Pro Gly Trp Trp Gln Pro Tyr
1 5 10

<210> 252
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 11 amino group added at C-terminus

<400> 252
Phe Glu Trp Thr Pro Asn Tyr Trp Gln Pro Tyr
1 5 10

<210> 253
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 253

Phe Glu Trp Thr Pro Val Tyr Trp Gln Xaa Tyr

1

5

10

<210> 254

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa is a pipecolic acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 254

Phe Glu Trp Thr Xaa Gly Tyr Trp Gln Xaa Tyr

1

5

10

<210> 255

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, Xaa=pipecolic acid

<220>

<223> At position 10, Xaa=azetidine

<400> 255

Phe Glu Trp Thr Pro Xaa Tyr Trp Gln Xaa Tyr
1 5 10

<210> 256

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=MeGly

<220>

<223> At position 10, Xaa=azetidine

<400> 256

Phe Glu Trp Thr Xaa Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 257

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 257

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 258

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is a 1-naphthylalanine residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 258

Xaa	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 259

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is a azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 259

Tyr	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 260

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 260

Phe	Glu	Trp	Val	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 261

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 261

Phe	Glu	Trp	Thr	Pro	Ser	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 262

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, amino group added at C-terminus

<400> 262

Phe Glu Trp Thr Pro Asn Tyr Tyr Gln Xaa Tyr

1

5

10

<210> 263

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 263

Thr Lys Pro Arg

1

<210> 264

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 264

Arg Lys Ser Ser Lys

1

5

<210> 265

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 265

Arg Lys Gln Asp Lys
1 5

<210> 266

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 266

Asn Arg Lys Gln Asp Lys
1 5

<210> 267

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 267

Arg Lys Gln Asp Lys Arg
1 5

<210> 268

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

PEPTIDE

<400> 268

Glu Asn Arg Lys Gln Asp Lys Arg Phe

1

5

<210> 269

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 269

Val Thr Lys Phe Tyr Phe

1

5

<210> 270

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 270

Val Thr Lys Phe Tyr

1

5

<210> 271

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 271

Val Thr Asp Phe Tyr
1 5

<210> 272
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 272
Ser Gly Ser Gly Val Leu Lys Arg Pro Leu Pro Ile Leu Pro Val Thr
1 5 10 15

Arg

<210> 273
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MCA/MCP
PROTEASE INHIBITOR PEPTIDE

<400> 273
Arg Trp Leu Ser Ser Arg Pro Leu Pro Pro Leu Pro Leu Pro Pro Arg
1 5 10 15

Thr

<210> 274
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MCA/MCP
PROTEASE

INHIBITOR PEPTIDE

<400> 274

Gly Ser Gly Ser Tyr Asp Thr Leu Ala Leu Pro Ser Leu Pro Leu His
1 5 10 15

Pro Met Ser Ser
20

<210> 275

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
PROTEASE INHIBITOR PEPTIDE

<400> 275

Gly Ser Gly Ser Tyr Asp Thr Arg Ala Leu Pro Ser Leu Pro Leu His
1 5 10 15

Pro Met Ser Ser
20

<210> 276

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
PROTEASE INHIBITOR PEPTIDE

<400> 276

Gly Ser Gly Ser Ser Gly Val Thr Met Tyr Pro Lys Leu Pro Pro His
1 5 10 15

Trp Ser Met Ala
20

<210> 277

<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MCA/MCP
PROTEASE INHIBITOR PEPTIDE

<400> 277
Gly Ser Gly Ser Ser Gly Val Arg Met Tyr Pro Lys Leu Pro Pro His
1 5 10 15

Trp Ser Met Ala
20

<210> 278
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MCA/MCP
PROTEASE INHIBITOR PEPTIDE

<400> 278
Gly Ser Gly Ser Ser Ser Met Arg Met Val Pro Thr Ile Pro Gly Ser
1 5 10 15

Ala Lys His Gly
20

<210> 279
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:ANTI-HBV
PEPTIDE

<400> 279
Leu Leu Gly Arg Met Lys
1 5

<210> 280

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ANTI-HBV
PEPTIDE

<400> 280

Ala Leu Leu Gly Arg Met Lys Gly

1

5

<210> 281

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ANTI-HBV
PEPTIDE

<400> 281

Leu Asp Pro Ala Phe Arg

1

5

<210> 282

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 282

Arg Pro Leu Pro Pro Leu Pro

1

5

<210> 283

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 283

Arg Glu Leu Pro Pro Leu Pro

1

5

<210> 284

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MSH3 ANTAGONIST

<400> 284

Ser Pro Leu Pro Pro Leu Pro

1

5

<210> 285

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 285

Gly Pro Leu Pro Pro Leu Pro

1

5

<210> 286

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 286

Arg Pro Leu Pro Ile Pro Pro

1

5

<210> 287

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MAST CELL
ANTAGONISTS/MAST CELL PROTEASE INHIBITOR

<400> 287

Arg Pro Leu Pro Ile Pro Pro

1

5

<210> 288

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 288

Arg Arg Leu Pro Pro Thr Pro

1

5

<210> 289

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 289

Arg Gln Leu Pro Pro Thr Pro

1

5

<210> 290

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 290

Arg Pro Leu Pro Ser Arg Pro

1

5

<210> 291

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 291

Arg Pro Leu Pro Thr Arg Pro

1

5

<210> 292

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 292

Ser Arg Leu Pro Pro Leu Pro

1

5

<210> 293

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 293

Arg Ala Leu Pro Ser Pro Pro

1

5

<210> 294

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 294

Arg Arg Leu Pro Arg Thr Pro

1

5

<210> 295

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 295

Arg Pro Val Pro Pro Ile Thr

1

5

<210> 296

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 296...

Ile Leu Ala Pro Pro Val Pro

1

5

<210> 297

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 297

Arg Pro Leu Pro Met Leu Pro

1

5

<210> 298

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 298

Arg Pro Leu Pro Ile Leu Pro

1

5

<210> 299

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 299

Arg Pro Leu Pro Ser Leu Pro

1

5

<210> 300

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 300

Arg Pro Leu Pro Ser Leu Pro

1

5

<210> 301

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 301

Arg Pro Leu Pro Met Ile Pro

1

5

<210> 302

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 302

Arg Pro Leu Pro Leu Ile Pro

1

5

<210> 303

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 303

Arg Pro Leu Pro Pro Thr Pro
1 5

<210> 304

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 304

Arg Ser Leu Pro Pro Leu Pro
1 5

<210> 305

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 305

Arg Pro Gln Pro Pro Pro Pro
1 5

<210> 306

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 306

Arg Gln Leu Pro Ile Pro Pro
1 5

<210> 307

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 307
Xaa Xaa Xaa Arg Pro Leu Pro Pro Leu Pro Xaa Pro
1 5 10

<210> 308
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 308
Xaa Xaa Xaa Arg Pro Leu Pro Pro Ile Pro Xaa Xaa
1 5 10

<210> 309
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 309
Xaa Xaa Xaa Arg Pro Leu Pro Pro Leu Pro Xaa Xaa
1 5 10

<210> 310
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 310

Arg Xaa Xaa Arg Pro Leu Pro Pro Leu Pro Xaa Pro
1 5 10

<210> 311

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 311

Arg Xaa Xaa Arg Pro Leu Pro Pro Leu Pro Pro Pro
1 5 10

<210> 312

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 312

Pro Pro Pro Tyr Pro Pro Pro Pro Ile Pro Xaa Xaa
1 5 10

<210> 313

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 313

Pro Pro Pro Tyr Pro Pro Pro Pro Val Pro Xaa Xaa
1 5 10

<210> 314

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 314

Leu Xaa Xaa Arg Pro Leu Pro Xaa Xaa Pro
1 5 10

<210> 315

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At position 1, Xaa is an aliphatic amino acid
residue

<400> 315

Xaa Xaa Xaa Arg Pro Leu Pro Xaa Leu Pro
1 5 10

<210> 316

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At position 4, Xaa is an aromatic amino acid
residue

<220>

<223> At position 9, Xaa is an aliphatic amino acid
residue

<400> 316

Pro Pro Xaa Xaa Tyr Pro Pro Pro Xaa Pro
1 5 10

<210> 317

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At position 1, Xaa is a basic amino acid residue

<220>

<223> At position 4, Xaa is an aliphatic amino acid
residue

<400> 317

Xaa Pro Pro Xaa Pro Xaa Lys Pro Xaa Trp Leu
1 5 10

<210> 318

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At position 4, Xaa is an aliphatic amino acid
residue

<220>

<223> At position 6, Xaa is an aliphatic amino acid
residue

<220>

<223> At position 8, Xaa is a basic amino acid residue

<400> 318

Arg Pro Xaa Xaa Pro Xaa Arg Xaa Ser Xaa Pro
1 5 10

<210> 319

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 319

Pro Pro Val Pro Pro Arg Pro Xaa Xaa Thr Leu
1 5 10

<210> 320

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At positions 1, 3 and 6, Xaa is an aliphatic
amino acid residue

<400> 320

Xaa Pro Xaa Leu Pro Xaa Lys
1 5

<210> 321

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<220>

<223> At position 1, Xaa is a basic amino acid residue

<220>

<223> At position 2, Xaa is an aromatic amino acid
residue

<400> 321

Xaa Xaa Asp Xaa Pro Leu Pro Xaa Leu Pro
1 5 10

<210> 322

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INHIBITOR OF
PLATELET AGGREGATION

<400> 322

Cys Xaa Xaa Arg Gly Asp Cys
1 5

<210> 323

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SRC ANTAGONIST

<400> 323

Arg Pro Leu Pro Pro Leu Pro
1 5

<210> 324

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SRC ANTAGONIST

<400> 324

Pro Pro Val Pro Pro Arg
1 5

<210> 325
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:ANTI-CANCER
PEPTIDE

<400> 325
Xaa Phe Xaa Asp Xaa Trp Xaa Xaa Leu Xaa Xaa
1 5 10

<210> 326
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:p16-MIMETIC
PEPTIDE

<400> 326
Lys Ala Cys Arg Arg Leu Phe Gly Pro Val Asp Ser Glu Gln Leu Ser
1 5 10 15

Arg Asp Cys Asp
20

<210> 327
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:p16-MIMETIC
PEPTIDE

<400> 327

Arg Glu Arg Trp Asn Phe Asp Phe Val Thr Glu Thr Pro Leu Glu Gly
1 5 10 15

Asp Phe Ala Trp
20

<210> 328

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:pl6-MIMETIC
PEPTIDE

<400> 328

Lys Arg Arg Gln Thr Ser Met Thr Asp Phe Tyr His Ser Lys Arg Arg
1 5 10 15

Leu Ile Phe Ser
20

<210> 329

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SH3 ANTAGONIST

<400> 329

Thr Ser Met Thr Asp Phe Tyr His Ser Lys Arg Arg Leu Ile Phe Ser
1 5 10 15

Lys Arg Lys Pro
20

<210> 330

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:p16-MIMETIC
PEPTIDE

<400> 330

Arg Arg Leu Ile Phe

1 5

<210> 331

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:p16-MIMETIC
PEPTIDE

<400> 331

Lys Arg Arg Gln Thr Ser Ala Thr Asp Phe Tyr His Ser Lys Arg Arg

1 5 10 15

Leu Ile Phe Ser Arg Gln Ile Lys Ile Trp Phe Gln Asn Arg Arg Met

20 25 30

Lys Trp Lys Lys

35

<210> 332

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:p16-MIMETIC
PEPTIDE

<400> 332

Lys Arg Arg Leu Ile Phe Ser Lys Arg Gln Ile Lys Ile Trp Phe Gln

1 5 10 15

Asn Arg Arg Met Lys Trp Lys Lys

20

<210> 333
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:POLYGLYCINE
LINKER

<400> 333
Gly Gly Gly Lys Gly Gly Gly Gly
1 5

<210> 334
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:POLYGLYCINE
LINKER

<400> 334
Gly Gly Gly Asn Gly Ser Gly Gly
1 5

<210> 335
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:POLYGLYCINE
LINKER

<400> 335
Gly Gly Gly Cys Gly Gly Gly Gly
1 5

<210> 336
<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:FC PCR PRIMER

<400> 336

Gly Pro Asn Gly Gly

1

5

<210> 337

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 337

Phe Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu

1

5

10

15

Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro

20

25

30

Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala

35

40

<210> 338

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 338

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly

1

5

10

15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu

20

25

30

Ala Ala Arg Ala Gly Gly Gly Gly Gly Phe

35

40

<210> 339

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 339

Phe Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly Pro
 1 5 10 15

Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Gly
 20 25 30

Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln
 35 40 45

Gly Gly
 50

<210> 340

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC

<400> 340

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
 1 5 10 15

Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe
 20 25 30

Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly
 35 40 45

Gly Phe ...
 50

<210> 341

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 341

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Ile Glu
1 5 10 15

Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
20 25

<210> 342

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 342

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Ile
1 5 10 15

Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
20 25

<210> 343

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 343

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25 30

<210> 344

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 344

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25 30

<210> 345

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 345

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 20 25 30

<210> 346

<211> 33

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 346

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg
 20 25 30

Ala

<210> 347

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 347

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala
 20 25 30

Arg Ala

<210> 348

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 348

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala

20

25

30

Ala Arg Ala
35

<210> 349

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC

<400> 349

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
20 25 30

Ala Ala Arg Ala
35

<210> 350

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 350

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp
20 25 30

Leu Ala Ala Arg Ala
35

<210> 351

<211> 38

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 351

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln
20 25 30

Trp Leu Ala Ala Arg Ala
35

<210> 352

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 352

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro
20 25 30

Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
35 40

<210> 353

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 353

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Pro
1 5 10 15

Asn Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
20 25 30

<210> 354

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 354

Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu
20 25 30

Ala Ala Arg Ala
35

<210> 355

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 355

Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Cys Leu
 20 25 30

Ala Ala Arg Ala
 35

<210> 356

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDES

<400> 356

Ile Glu Gly Pro Thr Leu Arg Gln Ala Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Ala Leu
 20 25 30

Ala Ala Arg Ala
 35

<210> 357

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
 PEPTIDES

<400> 357

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
 1 5 10 15

Gly Lys Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
 20 25 30

Ala Ala Arg Ala
 35

<210> 358
<211> 40
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 358
Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15
Gly Lys Asx Arg Ala Cys Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu
20 25 30
Arg Gln Trp Leu Ala Ala Arg Ala
35 40

<210> 359
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 359
Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15
Gly Cys Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
20 25 30
Ala Ala Arg Ala
35

<210> 360
<211> 39
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 360

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Lys Pro Glu Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg
20 25 30

Gln Trp Leu Ala Ala Arg Ala
35

<210> 361

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 361

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Cys Pro Glu Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg
20 25 30

Gln Trp Leu Ala Ala Arg Ala
35

<210> 362

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 362

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Asn Gly Ser Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
20 25 30

Ala Ala Arg Ala
35

<210> 363

<211> 36

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO-MIMETIC
PEPTIDES

<400> 363

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly
1 5 10 15

Gly Cys Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
20 25 30

Ala Ala Arg Ala
35

<210> 364

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP PCR
PRIMER

<400> 364

aaaaaaggat cctcgagatt aagcacgagc agccagccac tgacgcagag tcggacc 57

<210> 365

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP PCR
PRIMER

<400> 365

aaaggtggag gtggtggtat cgaaggtccg actctgcgt

39

<210> 366

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 366

cagtggctgg ctgctcgtgc ttaatctcga ggatcctttt tt

42

<210> 367

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 367

aaaggtggag gtggtggtat cgaaggtccg actctgcgtc agtggctggc tgctcgtgct 60
taatctcgag gatccttttt t 81

<210> 368

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 368

ttcgatacca ccacctccac ctttaccgg agacaggag aggctcttct gc

52

<210> 369

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP-TMP

<400> 369

aaaggtggag gtggtggtat cgaaggtccg actctgcgtc agtggctggc tgctcgtgct 60

<210> 370

<211> 48

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:FC PCR PRIMER

<400> 370

acctccacca ccagcacgag cagccagcca ctgacgcaga gtcggacc

48

<210> 371

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP-TMP
OLIGONUCLEOTIDE

<400> 371

ggtggtggag gtggcggcgg aggtattgag ggcccaaccc ttcgccaatg gcttgcagca 60
cgcgca 66

<210> 372

<211> 76

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP-TMP
OLIGONUCLEOTIDE

<400> 372

aaaaaaagga tcctcgagat tatgcgcgtg ctgcaagcca ttggcgaagg gttgggccct 60
 caatacctcc gccgcc 76

<210> 373

<211> 126

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TNF ALPHA
 PCR PRIMER

<220>

<221> CDS

<222> (1) .. (126)

<400> 373

aaa ggt gga ggt ggt ggt atc gaa ggt ccg act ctg cgt cag tgg ctg 48
 Lys Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
 1 5 10 15

gct gct cgt gct ggt ggt gga ggt ggc ggc gga ggt att gag ggc cca 96
 Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro
 20 25 30

acc ctt cgc caa tgg ctt gca gca cgc gca 126
 Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 35 40

<210> 374

<211> 42

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TNF ALPHA
 PCR PRIMER

<400> 374

Lys Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
 1 5 10 15

Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro
 20 25 30

Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala
 35 40

<210> 375
 <211> 39
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Fc-MMP
 INHIBITOR

<220>
 <221> CDS
 <222> (4)..(732)

<400> 375
 ttt ttt cat atg atc gaa ggt ccg act ctg cgt cag tgg 39
 Phe His Met Ile Glu Gly Pro Thr Leu Arg Gln Trp
 1 5 10

<210> 376
 <211> 12
 <212> PRT
 <213> Artificial Sequence
 <223> Description of Artificial Sequence:Fc-MMP
 INHIBITOR

<400> 376
 Phe His Met Ile Glu Gly Pro Thr Leu Arg Gln Trp
 1 5 10

<210> 377
 <211> 48
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:MMP INHIBITOR
 Fc

<220>
 <221> CDS
 <222> (4)..(753)

<400> 377

agc acg agc agc cag cca ctg acg cag agt cgg acc ttc gat cat atg 48
 Thr Ser Ser Gln Pro Leu Thr Gln Ser Arg Thr Phe Asp His Met
 1 5 10 15

<210> 378

<211> 15

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:MMP INHIBITOR
 Fc

<400> 378

Thr Ser Ser Gln Pro Leu Thr Gln Ser Arg Thr Phe Asp His Met
 1 5 10 15

<210> 379

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TMP-TMP-Fc
 OLIGONUCLEOTIDE

<400> 379

ctggctgctc gtgctggtgg aggcggtggg gacaaaactc acaca 45

<210> 380

<211> 51

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
 BINDING PEPTIDE

<400> 380

ctggctgctc gtgctggcgg tgggtggcgga gggggtggca ttgagggccc a 51

<210> 381

<211> 54

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 381

aagccattgg cgaagggttg ggccctcaat gccaccccct ccgccaccac cgcc 54

<210> 382

<211> 54

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 382

acccttcgcc aatggcttgc agcacgcgca gggggaggcg gtggggacaa aact 54

<210> 383

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 383

cccaccgcct ccccctgcgc gtgctgc 27

<210> 384

<211> 189

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<220>

<221> CDS

<222> (10)..(189)

<400> 384

ttttttcat atg atc gaa ggt ccg act ctg cgt cag tgg ctg gct gct cgt 51
 Met Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg
 1 5 10

gct ggc ggt ggt ggc gga ggg ggt ggc att gag ggc cca acc ctt cgc 99
 Ala Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg
 15 20 25 30

caa tgg ctg gct gct cgt gct ggt gga ggc ggt ggg gac aaa act ctg 147
 Gln Trp Leu Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Asp Lys Thr Leu
 35 40 45

gct gct cgt gct ggt gga ggc ggt ggg gac aaa act cac aca 189
 Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Asp Lys Thr His Thr
 50 55 60

<210> 385

<211> 60

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:INTEGRIN
 BINDING PEPTIDE

<400> 385

Met Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly
 1 5 10 15

Gly Gly Gly Gly Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp
 20 25 30

Leu Ala Ala Arg Ala Gly Gly Gly Gly Gly Gly Asp Lys Thr Leu Ala Ala
 35 40 45

Arg Ala Gly Gly Gly Gly Gly Gly Asp Lys Thr His Thr
 50 55 60

<210> 386

<211> 141

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN

BINDING PEPTIDE

<400> 386

ctaattccgc tctcacctac caaacaatgc ccccttgcaa aaaataaatt catataaaaa 60
 acatacagat aaccatctgc ggtgataaat tatctctggc ggtgttgaca taaataccac 120
 tggcggtgat actgagcaca t 141

<210> 387

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
 BINDING PEPTIDE

<400> 387

cgatttgatt ctagaaggag gaataacata tggttaacgc gttggaattc ggtac 55

<210> 388

<211> 872

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
 BINDING PEPTIDE

<400> 388

ttatatttcgt gcggccgcac cattatcacc gccagaggta aactagtcaa cacgcacggt 60
 gttagatatt tatcccttgc ggtgatagat tgagcacatc gatttgattc tagaaggagg 120
 gataatatat gagcacaaaa aagaaacat taacacaaga gcagcttgag gacgcacgtc 180
 gccttaaagc aatttatgaa aaaaagaaaa atgaacttgg cttatcccag gaatctgtcg 240
 cagacaagat ggggatgggg cagtcaggcg ttggtgcttt atttaatggc atcaatgcat 300
 taaatgctta taacgccgca ttgcttaca aaattctcaa agttagcgtt gaagaattta 360
 gcccttcaat cgccagagaa tctacgagat gtatgaagcg gttagtatgc agccgtcact 420
 tagaagtgag tatgagtacc ctgttttttc tcatgttcag gcagggatgt tctcacctaa 480
 gcttagaacc tttaacaaag gtgatgcgga gagatgggta agcacaacca aaaaagccag 540
 tgattctgca ttctggcttg aggttgaagg taattccatg accgcaccaa caggctccaa 600
 gccaaagcttt cctgacggaa tgttaattct cgttgaccct gagcaggctg ttgagccagg 660
 tgatttctgc atagccagac ttgggggtga tgagtattacc ttcaagaaac tgatcaggga 720
 tagcggtcag gtgtttttac aaccactaaa cccacagtac ccaatgatcc catgcaatga 780
 gagttgttcc gttgtgggga aagttatcgc tagtcagtgg cctgaagaga cgtttggtcg 840
 atagactagt ggatccacta gtgtttctgc cc 872

<210> 389
 <211> 1197
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: INTEGRIN
 BINDING PEPTIDE

<400> 389

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ggcggaaacc gacgtccatc gaatggtgca aaaccttttcg cggtatggca tgatagcgcc 60
cggaagagag tcaattcagg gtggtgaatg tgaaaccagt aacgttatac gatgtcgag 120
agtatgccgg tgtctcttat cagaccgttt cccgcgtggt gaaccaggcc agccacgttt 180
ctgcgaaaac gcgggaaaaa gtcgaagcgg cgatggcgga gctgaattac attcccaacc 240
gcgtggcaca acaactggcg ggcaaacagt cgctcctgat tggcgttgcc acctccagtc 300
tggccctgca cgcgccgtcg caaattgtcg cggcgattaa atctcgcgcc gatcaactgg 360
gtgccagcgt ggtggtgtcg atggtagaac gaagcggcgt cgaagcctgt aaagcggcgg 420
tgcacaatct tctcgcgcaa cgcgtcagtg ggctgatcat taactatccg ctggatgacc 480
aggatgccat tgctgtggaa gctgcctgca ctaatgttcc ggcgttattt cttgatgtct 540
ctgaccagac acctatcaac agtattattt tctcccatga agacggtacg cgactgggcg 600
tggagcatct ggtcgcatcg ggtcaccagc aaatcgcgct gttagcgggc ccattaagtt 660
ctgtctcggc gcgtctgcgt ctggctggct ggcatataa tctcactcgc aatcaaattc 720
agccgatagc ggaacgggaa ggcgactgga gtgccatgtc cggttttcaa caaacatgc 780
aaatgctgaa tgagggcatc gttccactcg cgatgctggt tgccaacgat cagatggcgc 840
tgggcgcaat gcgcgccatt accgagtcgg ggctgcgcgt tgggtgcggat atctcggtag 900
tgggatacga cgataccgaa gacagctcat gttatatccc gccgttaacc accatcaaac 960
aggatttttc cctgctgggg caaaccagcg tggaccgctt gctgcaactc tctcagggcc 1020
aggcggtgaa gggcaatcag ctgttgcccc tctcactggt gaaaagaaaa accaccctgg 1080
cgcccaatac gcaaaccgcc tctccccgcg cgttggccga ttcattaatg cagctggcac 1140
gacaggtttc ccgactggaa agcggacagt aaggtaccat aggatccagg cacagga 1197

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<210> 390
 <211> 61
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Fc-EMP
 OLIGONUCLEOTIDE

<400> 390

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tatgaaaggt ggaggtggtg gtggaggtac ttactcttgc cacttcggcc cgctgacttg 60
g

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<210> 391
 <211> 72

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP
OLIGONUCLEOTIDE

<400> 391

cggtttgcaa acccaagtca gcgggccgaa gtggcaagag taagtacctc caccaccacc 60
tccacctttc at 72

<210> 392

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP
OLIGONUCLEOTIDE

<400> 392

gtttgcaaac cgcaggggtgg cggcggcggc ggcgggtgta cctattcctg tcatttt 57

<210> 393

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP
OLIGONUCLEOTIDE

<400> 393

ccaggtcagc gggccaaaat gacaggaata ggtaccaccg ccgccgccgc cgccaccctg 60

<210> 394

<211> 118

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP PCR
TEMPLATE

<220>

<221> CDS

<222> (2) .. (118)

<400> 394

t atg aaa ggt gga ggt ggt ggt gga ggt act tac tct tgc cac ttc ggc 49

Met Lys Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly

1

5

10

15

ccg ctg act tgg gtt tgc aaa ccg cag ggt ggc ggc ggc ggc ggc ggt 97

Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly

20

25

30

ggt acc tat tcc tgt cat ttt

118

Gly Thr Tyr Ser Cys His Phe

35

<210> 395

<211> 39

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-EMP PCR

TEMPLATE

<400> 395

Met Lys Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His Phe Gly

1

5

10

15

Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly

20

25

30

Gly Thr Tyr Ser Cys His Phe

35

<210> 396

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP PCR

PRIMER

<400> 396

gcagaagagc ctctccctgt ctccgggtaa aggtggaggt ggtgggtggag gtacttactc 60

t

61

<210> 397

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP PCR
PRIMER

<400> 397

ctaattggat ccacgagatt aaccaccctg cggtttgcaa

40

<210> 398

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc PRIMER

<400> 398

aacataagta cctgtaggat cg

22

<210> 399

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc PRIMER

<400> 399

agagtaagta cctccaccac cacctccacc ttaccgga gacagggaga ggctcttctg 60
c 61

<210> 400

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-Fc
OLIGONUCLEOTIDE

<400> 400

ggcccgctga cctgggtatg taagccacaa ggggggtgggg gaggcggggg gtaatctcga 60
g 61

<210> 401

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-Fc
OLIGONUCLEOTIDE

<400> 401

gacctcgag attaccccc gcctcccca ccccttggtg gcttacatac 50

<210> 402

<211> 118

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-Fc PCR
TEMPLATE

<220>

<221> CDS

<222> (1)..(108)

<400> 402

gtt tgc aaa ccg cag ggt ggc ggc ggc ggc ggc ggt ggt acc tat tcc 48
Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser
1 5 10 15

tgt cat ttt ggc ccg ctg acc tgg gta tgt aag cca caa ggg ggt ggg 96
Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly
20 25 30

gga ggc ggg ggg taatctcgag 118
Gly Gly Gly Gly
35

<210> 403

<211> 36

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:EMP-Fc PCR
TEMPLATE

<400> 403

Val Cys Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser
1 5 10 15

Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly
20 25 30

Gly Gly Gly Gly
35

<210> 404

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-Fc PCR
PRIMER

<400> 404

ttatttcata tgaaagggtgg taactattcc tgtcatttt

39

<210> 405

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-Fc PCR
PRIMER

<400> 405

tggacatgtg tgagttttgt cccccccgcc tcccccaccc cct

43

<210> 406

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc PRIMER

<400> 406

agggggtggg ggagggcgggg gggacaaaac tcacacatgt cca

43

<210> 407

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc PRIMER

<400> 407

gttattgctc agcgggtggca

20

<210> 408

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 408

ttttttatcg atttgattct agatttgagt tttaactttt agaaggagga ataaaatatg 60

<210> 409

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 409

taaaagttaa aactcaaadc tagaatcaaa tcgataaaaa a

41

<210> 410

<211> 51

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 410

ggaggtactt actcttgcca cttcggcccg ctgacttggg tttgcaaacc g 51

<210> 411

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 411

agtcagcggg ccgaagtggc aagagtaagt acctcccata ttttattcct ccttc 55

<210> 412

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 412

caggggtggcg gcggcgggcg cggtggtacc tattcctgtc attttgccc gctgacctgg 60

<210> 413

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 413

aaaatgacag gaataggtac caccgccgcc gccgccgcca ccctgcggtt tgcaaacc 60

<210> 414

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 414

gtatgtaagc cacaaggggg tgggggaggc gggggggaca aaactcacac atgtcca 57

<210> 415

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc
OLIGONUCLEOTIDE

<400> 415

agttttgtcc ccccgccctc cccaccccc ttgtggctta catacccagg tcagcgggcc 60

<210> 416

<211> 228

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EMP-EMP-Fc PCR
TEMPLATE

<220>

<221> CDS

<222> (58)..(228)

<400> 416

tttttttatcg atttgattct agatttgagt tttaactttt agaaggagga ataaaat 57

atg gga ggt act tac tct tgc cac ttc ggc ccg ctg act tgg gtt tgc 105
Met Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys
1 5 10 15

aaa ccg cag ggt ggc ggc ggc ggc ggc ggt ggt acc tat tcc tgt cat 153

Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His
 20 25 30

ttt ggc ccg ctg acc tgg gta tgt aag cca caa ggg ggt ggg gga ggc 201
 Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly
 35 40 45

ggg ggg gac aaa act cac aca tgt cca 228
 Gly Gly Asp Lys Thr His Thr Cys Pro
 50 55

<210> 417

<211> 57

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:EMP-EMP-Fc PCR
 TEMPLATE

<400> 417

Met Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys
 1 5 10 15

Lys Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Thr Tyr Ser Cys His
 20 25 30

Phe Gly Pro Leu Thr Trp Val Cys Lys Pro Gln Gly Gly Gly Gly Gly
 35 40 45

Gly Gly Asp Lys Thr His Thr Cys Pro
 50 55

<210> 418

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-EMP-EMP PCR
 PRIMER

<400> 418

ctaattggat cctcgagatt aacccccttg tggcttacat

40

<210> 419

<211> 72

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 419

Xaa	Tyr	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
1				5						10						15

Gly	Pro	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Thr	Trp	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				20					25						30	

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				35						40					45	

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				50						55					60	

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				65			70

<210> 420

<211> 62

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 420

Xaa	Tyr	Xaa	Xaa	Cys	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Gly	Pro
1				5						10					15

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Thr	Trp	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Cys
				20						25					30	

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				35						40					45	

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
				50						55					60	

<210> 421

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<220>

<223> At position 2, Xaa is R, H, L or W

<220>

<223> At position 3, Xaa is M, F or I

<220>

<223> At position 6, Xaa is any of the 20 genetically
encoded amino acid residues or a D-stereoisomer
thereof

<220>

<223> At position 9, Xaa is D, E, I, L or V

<400> 421

Cys	Xaa	Xaa	Gly	Pro	Xaa	Thr	Trp	Xaa	Cys
1				5					10

<210> 422

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 422

Gly	Gly	Thr	Tyr	Ser	Cys	His	Gly	Pro	Leu	Thr	Trp	Val	Cys	Lys	Pro
1				5					10					15	

Gln Gly Gly

<210> 423

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 423

Val Gly Asn Tyr Met Ala His Met Gly Pro Ile Thr Trp Val Cys Arg
1 5 10 15

Pro Gly Gly

<210> 424

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 424

Gly Gly Pro His His Val Tyr Ala Cys Arg Met Gly Pro Leu Thr Trp
1 5 10 15

Ile Cys

<210> 425

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 425

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys

1

5

10

15

Pro Gln

<210> 426

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 426

Gly Gly Leu Tyr Ala Cys His Met Gly Pro Met Thr Trp Val Cys Gln
1 5 10 15Pro Leu Arg Gly
20

<210> 427

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 427

Thr Ile Ala Gln Tyr Ile Cys Tyr Met Gly Pro Glu Thr Trp Glu Cys
1 5 10 15Arg Pro Ser Pro Lys Ala
20

<210> 428

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 428

Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10

<210> 429

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 429

Tyr Cys His Phe Gly Pro Leu Thr Trp Val Cys
1 5 10

<210> 430

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 430

Ala Glu Pro Val Tyr Gln Tyr Glu Leu Asp Ser Tyr Leu Arg Ser Tyr
1 5 10 15

Tyr

<210> 431

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 431

Ala Glu Leu Asp Leu Ser Thr Phe Tyr Asp Ile Gln Tyr Leu Leu Arg
1 5 10 15

Thr

<210> 432

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 432

Ala Glu Phe Phe Lys Leu Gly Pro Asn Gly Tyr Val Tyr Leu His Ser
1 5 10 15

Ala

<210> 433

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 433

Phe Lys Leu Xaa Xaa Xaa Gly Tyr Val Tyr Leu
1 5 10

<210> 434

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 434

Ala Glu Ser Thr Tyr His His Leu Ser Leu Gly Tyr Met Tyr Thr Leu
1 5 10 15

Asn

<210> 435

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:UKR ANTAGONIST
PEPTIDE

<400> 435

Tyr His Xaa Leu Xaa Xaa Gly Tyr Met Tyr Thr
1 5 10

<210> 436

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
INHIBITOR

<400> 436

Arg Asn Arg Gln Lys Thr
1 5

<210> 437

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
INHIBITOR

<400> 437

Arg Asn Arg Gln

1

<210> 438

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
INHIBITOR

<400> 438

Arg Asn Arg Gln Lys

1

5

<210> 439

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
INHIBITOR

<400> 439

Asn Arg Gln Lys Thr

1

5

<210> 440

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MCA/MCP
INHIBITOR

<400> 440

Arg Gln Lys Thr

1

<210> 441

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 441

Arg Xaa Glu Thr Xaa Trp Xaa

1

5

<210> 442

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 442

Arg Xaa Glu Thr Xaa Trp Xaa

1

5

<210> 443

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 443

Arg Gly Asp Gly Xaa

1

5

<210> 444

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 444

Cys Arg Gly Asp Gly Xaa Cys

1

5

<210> 445

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 445

Cys Xaa Xaa Arg Leu Asp Xaa Xaa Cys

1

5

<210> 446

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 446

Cys Ala Arg Arg Leu Asp Ala Pro Cys

1

5

<210> 447

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 447

Cys Pro Ser Arg Leu Asp Ser Pro Cys

1

5

<210> 448

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 448

Xaa Xaa Xaa Arg Gly Asp Xaa Xaa Xaa

1

5

<210> 449

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 449

Cys Xaa Cys Arg Gly Asp Cys Xaa Cys

1

5

<210> 450
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 450
Cys Asp Cys Arg Gly Asp Cys Phe Cys
1 5

<210> 451
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 451
Cys Asp Cys Arg Gly Asp Cys Leu Cys
1 5

<210> 452
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 452
Cys Leu Cys Arg Gly Asp Cys Ile Cys
1 5

<210> 453
<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 453

Xaa Xaa Asp Asp Xaa Xaa Xaa Xaa

1

5

<210> 454

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 454

Xaa Xaa Xaa Asp Asp Xaa Xaa Xaa Xaa Xaa

1

5

10

<210> 455

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 455

Cys Trp Asp Asp Gly Trp Leu Cys

1

5

<210> 456

<211> 9

<212> PRT ...

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 456

Cys Trp Asp Asp Leu Trp Trp Leu Cys
1 5

<210> 457

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 457

Cys Trp Asp Asp Gly Leu Met Cys
1 5

<210> 458

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 458

Cys Trp Asp Asp Gly Trp Met Cys
1 5

<210> 459

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 459

Cys Ser Trp Asp Asp Gly Trp Leu Cys

1

5

<210> 460

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 460

Cys Pro Asp Asp Leu Trp Trp Leu Cys

1

5

<210> 461

<211> 40

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 461

Tyr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly

1

5

10

15

Pro Xaa Xaa Xaa Xaa Xaa Xaa Thr Trp Xaa Xaa Xaa Xaa Xaa Xaa Xaa

20

25

30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa

35

40

<210> 462

<211> 16

<212> PRT...

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 462

Cys	Gln	Asn	Arg	Tyr	Thr	Asp	Leu	Val	Ala	Ile	Gln	Asn	Lys	Asn	Glu
1				5					10					15	

<210> 463

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:SELECTIN-ANTAGONIST PEPTIDE

<400> 463

Ala	Glu	Asn	Trp	Ala	Asp	Asn	Glu	Pro	Asn	Asn	Lys	Arg	Asn	Asn	Glu
1				5					10					15	

Asp

<210> 464

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 464

Arg	Lys	Asn	Asn	Lys	Thr	Trp	Thr	Trp	Val	Gly	Thr	Lys	Lys	Ala	Leu
1				5					10					15	

Thr Asn Glu

<210> 465

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 465

Lys Lys Ala Leu Thr Asn Glu Ala Glu Asn Trp Ala Asp
1 5 10

<210> 466

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 466

Cys Gln Xaa Arg Tyr Thr Asp Leu Val Ala Ile Gln Asn Lys Xaa Glu
1 5 10 15

<210> 467

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 467

Arg Lys Xaa Asn Xaa Xaa Trp Thr Trp Val Gly Thr Xaa Lys Xaa Leu
1 5 10 15

Thr Glu Glu

<210> 468

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 468

Ala Glu Asn Trp Ala Asp Gly Glu Pro Asn Asn Lys Xaa Asn Xaa Glu
1 5 10 15

Asp

<210> 469

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 469

Cys Xaa Xaa Xaa Tyr Thr Xaa Leu Val Ala Ile Gln Asn Lys Xaa Glu
1 5 10 15

<210> 470

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SELECTIN
ANTAGONIST PEPTIDE

<400> 470

Arg Lys Xaa Xaa Xaa Xaa Trp Xaa Trp Val Gly Thr Xaa Lys Xaa Leu
1 5 10 15

Thr Xaa Glu

<210> 471

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SELECTIN
ANTAGONIST PEPTIDE

<400> 471

Ala Xaa Asn Trp Xaa Xaa Xaa Glu Pro Asn Asn Xaa Xaa Xaa Glu Asp
1 5 10 15

<210> 472

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SELECTIN
ANTAGONIST PEPTIDE

<400> 472

Xaa Lys Xaa Lys Thr Xaa Glu Ala Xaa Asn Trp Xaa Xaa
1 5 10

<210> 473

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: SOMATOSTATIN/
CORTISTATIN-MIMETIC PEPTIDE

<220>

<223> At position 1, Xaa is asp-arg-met-pro-cys,
arg-met-pro-cys, met-pro-cys, pro-cys, or cys

<220>

<223> At position 2, Xaa is arg or lys

<220>

<223> At position 10, Xaa is ser or thr

<220>

<223> At position 12, xaa is cys-lys or cys

<400> 473

Xaa Xaa Asn Phe Phe Trp Lys Thr Phe Xaa Ser Xaa

1

5

10

<210> 474

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN-MIMETIC PEPTIDE

<400> 474

Asp Arg Met Pro Cys Arg Asn Phe Phe Phe Trp Lys Thr Phe Ser Ser

1

5

10

15

Cys Lys

<210> 475

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN-MIMETIC PEPTIDE

<400> 475

Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys

1

5

10

15

<210> 476

<211> 13 ...

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN-MIMETIC PEPTIDE

<400> 476

Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys
1 5 10

<210> 477

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN-MIMETIC PEPTIDE

<400> 477

Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10 15

<210> 478

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 478

Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10

<210> 479

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/

CORTISTATIN MIMETIC PEPTIDE

<400> 479

Cys Arg Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10

<210> 480

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 480

Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10 15

<210> 481

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 481

Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys
1 5 10 15

<210> 482

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 482

Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys Lys
1 5 10

<210> 483

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 483

Asp Arg Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10 15

<210> 484

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TMP

<400> 484

Met Pro Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10

<210> 485

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 485

Cys Lys Asn Phe Phe Trp Lys Thr Phe Ser Ser Cys
1 5 10

<210> 486

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 486

Asp	Arg	Met	Pro	Cys	Arg	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys
1				5					10					15	

Lys

<210> 487

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 487

Met	Pro	Cys	Arg	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys	Lys
1				5				10					15	

<210> 488

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 488

Cys	Arg	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys	Lys
1				5				10				

<210> 489

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 489

Asp Arg Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys
1 5 10 15

<210> 490

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 490

Met Pro Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys
1 5 10

<210> 491

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 491

Cys Arg Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys
1 5 10

<210> 492

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 492

Asp	Arg	Met	Pro	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys
1				5					10					15	

Lys

<210> 493

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 493

Met	Pro	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys	Lys
1				5				10					15	

<210> 494

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 494

Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys	Lys
1				5				10				

<210> 495

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 495

Asp	Arg	Met	Pro	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys
1				5					10					15	

<210> 496

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 496

Met	Pro	Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys
1				5				10					

<210> 497

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:SOMATOSTATIN/
CORTISTATIN MIMETIC PEPTIDE

<400> 497

Cys	Lys	Asn	Phe	Phe	Trp	Lys	Thr	Phe	Thr	Ser	Cys
1				5				10			

<210> 498

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CAP37
MIMETIC/LPS BINDING PEPTIDE

<400> 498

Asn Gln Gly Arg His Phe Cys Gly Gly Ala Leu Ile His Ala Arg Phe
1 5 10 15

Val Met Thr Ala Ala Ser Cys Phe Gln
20 25

<210> 499

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CAP37
MIMETIC/LPS BINDING PEPTIDE

<400> 499

Arg His Phe Cys Gly Gly Ala Leu Ile His Ala Arg Phe Val Met Thr
1 5 10 15

Ala Ala Ser Cys
20

<210> 500

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CAP37
MIMETIC/LPS BINDING PEPTIDE

<400> 500

Gly Thr Arg Cys Gln Val Ala Gly Trp Gly Ser Gln Arg Ser Gly Gly
1 5 10 15

Arg Leu Ser Arg Phe Pro Arg Phe Val Asn Val
20 25

<210> 501

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: VEGF-ANTAGONIST
PEPTIDE

<400> 501

Gly Glu Arg Trp Cys Phe Asp Gly Pro Arg Ala Trp Val Cys Gly Trp
1 5 10 15

Glu Ile

<210> 502

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: VEGF ANTAGONIST
PEPTIDE

<400> 502

Glu Glu Leu Trp Cys Phe Asp Gly Pro Arg Ala Trp Val Cys Gly Tyr
1 5 10 15

Val Lys

<210> 503

<211> 33

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: ANTIPATHOGENIC
PEPTIDE

<400> 503

Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro Leu Phe Lys

1 5 10 15
Thr Leu Leu Ser Ala Val Gly Ser Ala Leu Ser Ser Ser Gly Gly Gln
 20 25 30

Gln

<210> 504

<211> 33

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ANTIPATHOGENIC
PEPTIDE

<220>

<223> At positions 7, 18 and 19, D amino acid residue

<400> 504

Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro Leu Phe Lys
1 5 10 15

Thr Leu Leu Ser Ala Val Gly Ser Ala Leu Ser Ser Ser Gly Gly Gln
 20 25 30

Glu

<210> 505

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ANTIPATHOGENIC
PEPTIDE

<220>

<223> At positions 18 and 19, D amino acid residues

<400> 505

Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro Leu Phe Lys

1 5 10 15
Thr Leu Leu Ser Ala Val
20

<210> 506
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>
<223> At positions 7, 18 and 19, D amino acid residues

<400> 506
Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro Leu Phe Lys
1 5 10 15

Thr Leu Leu Ser Ala Val
20

<210> 507
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>
<223> At positions 8, 19 and 20, D amino acid residues

<400> 507
Lys Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro Leu Phe
1 5 10 15

Lys Thr Leu Leu Ser Ala Val
20

<210> 508

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 9, 20 and 21, D amino acid residues

<400> 508

Lys	Lys	Gly	Phe	Phe	Ala	Leu	Ile	Pro	Lys	Ile	Ile	Ser	Ser	Pro	Leu
1				5				10						15	

Phe	Lys	Thr	Leu	Leu	Ser	Ala	Val
				20			

<210> 509

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 9, 20 and 21, D amino acid residues

<400> 509

Lys	Lys	Gly	Phe	Phe	Ala	Leu	Ile	Pro	Lys	Ile	Ile	Ser	Ser	Pro	Leu
1				5				10						15	

Phe	Lys	Thr	Leu	Leu	Ser	Ala	Val
				20			

<210> 510

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 7, D amino acid residue

<400> 510

Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser
1 5 10

<210> 511

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 511

Gly Ile Gly Ala Val Leu Lys Val Leu Thr Thr Gly Leu Pro Ala Leu
1 5 10 15Ile Ser Trp Ile Lys Arg Lys Arg Gln Gln
20 25

<210> 512

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 5, 8, 17 and 23, D amino acid
residues

<400> 512

Gly Ile Gly Ala Val Leu Lys Val Leu Thr Thr Gly Leu Pro Ala Leu
1 5 10 15

Ile Ser Trp Ile Lys Arg Lys Arg Gln Gln
20 25

<210> 513

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 5, 8, 17 and 23, D amino acid
residues

<400> 513

Gly Ile Gly Ala Val Leu Lys Val Leu Thr Thr Gly Leu Pro Ala Leu
1 5 10 15

Ile Ser Trp Ile Lys Arg Lys Arg Gln Gln
20 25

<210> 514

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 5, 8, 17 and 21, D amino acid
residues

<400> 514

Gly Ile Gly Ala Val Leu Lys Val Leu Thr Thr Gly Leu Pro Ala Leu
1 5 10 15

Ile Ser Trp Ile Lys Arg
20

<210> 515

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 2, 5, 14 and 18, D amino acid
residues

<400> 515

Ala Val Leu Lys Val Leu Thr Thr Gly Leu Pro Ala Leu Ile Ser Trp
1 5 10 15

Ile Lys Arg

<210> 516

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 3, 4, 8 and 10, D amino acid residues

<400> 516

Lys Leu Leu Leu Leu Lys Leu Leu Leu Lys
1 5 10

<210> 517

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<220>

<223> At positions 3, 4, 8 and 10, D amino acid residues

<400> 517

Lys Leu Leu Leu Lys Leu Leu Leu Lys Leu Leu Lys
1 5 10

<210> 518

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 3, 4, 8 and 10, D amino acid residues

<400> 518

Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys
1 5 10

<210> 519

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 519

Lys Lys Leu Leu Lys Leu Lys Leu Lys Leu Lys Lys
1 5 10

<210> 520

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 520

Lys Leu Leu Leu Lys Leu Leu Leu Lys Leu Leu Lys
1 5 10

<210> 521

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 521

Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys
1 5 10

<210> 522

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 522

Lys Leu Leu Leu Lys
1 5

<210> 523

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<400> 523

Lys Leu Leu Leu Lys Leu Leu Lys

1

5

<210> 524

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 524

Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys

1

5

10

<210> 525

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 525

Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys

1

5

10

<210> 526

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 526

Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys
1 5 10

<210> 527

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 527

Lys Ala Ala Ala Lys Ala Ala Ala Lys Ala Ala Lys
1 5 10

<210> 528

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 528

Lys Val Val Val Lys Val Val Val Lys Val Val Lys
1 5 10

<210> 529

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 529 ...

Lys Val Val Val Lys Val Lys Val Lys Val Val Lys
1 5 10

<210> 530

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 530

Lys Val Val Val Lys Val Lys Val Lys Val Lys
1 5 10

<210> 531

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 531

Lys Val Val Val Lys Val Lys Val Lys Val Val Lys
1 5 10

<210> 532

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 532

Lys Leu Ile Leu Lys Leu
1 5

<210> 533

<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 533
Lys Val Leu His Leu Leu
1 5

<210> 534
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 534
Leu Lys Leu Arg Leu Leu
1 5

<210> 535
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 535
Lys Pro Leu His Leu Leu
1 5

<210> 536
<211> 8
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 536

Lys Leu Ile Leu Lys Leu Val Arg
1 5

<210> 537

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 537

Lys Val Phe His Leu Leu His Leu
1 5

<210> 538

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 538

His Lys Phe Arg Ile Leu Lys Leu
1 5

<210> 539

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<400> 539

Lys Pro Phe His Ile Leu His Leu

1

5

<210> 540

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 540

Lys Ile Ile Ile Lys Ile Lys Ile Lys Ile Ile Lys

1

5

10

<210> 541

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 541

Lys Ile Ile Ile Lys Ile Lys Ile Lys Ile Ile Lys

1

5

10

<210> 542

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 542

Lys Ile Ile Ile Lys Ile Lys Ile Lys Ile Ile Lys
1 5 10

<210> 543

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 543

Lys Ile Pro Ile Lys Ile Lys Ile Lys Ile Pro Lys
1 5 10

<210> 544

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 544

Lys Ile Pro Ile Lys Ile Lys Ile Lys Ile Val Lys
1 5 10

<210> 545

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 545

Arg Ile Ile Ile Arg Ile Arg Ile Arg Ile Ile Arg
1 5 10

<210> 546

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 546

Arg Ile Ile Ile Arg Ile Arg Ile Arg Ile Ile Arg
1 5 10

<210> 547

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 547

Arg Ile Ile Ile Arg Ile Arg Ile Arg Ile Ile Arg
1 5 10

<210> 548

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 548

Arg Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg
1 5 10

<210> 549

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 549
Arg Ile Ile Val Arg Ile Arg Leu Arg Ile Ile Arg
1 5 10

<210> 550
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 550
Arg Ile Gly Ile Arg Leu Arg Val Arg Ile Ile Arg
1 5 10

<210> 551
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 551
Lys Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg
1 5 10

<210> 552
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 552

Arg Ile Ala Val Lys Trp Arg Leu Arg Phe Ile Lys
1 5 10

<210> 553

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 553

Lys Ile Gly Trp Lys Leu Arg Val Arg Ile Ile Arg
1 5 10

<210> 554

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 554

Lys Lys Ile Gly Trp Leu Ile Ile Arg Val Arg Arg
1 5 10

<210> 555

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<400> 555

Arg Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg Ile Arg
1 5 10

<210> 556

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 556

Arg Ile Ile Val Arg Ile Arg Leu Arg Ile Ile Arg Val Arg
1 5 10

<210> 557

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 557

Arg Ile Gly Ile Arg Leu Arg Val Arg Ile Ile Arg Arg Val
1 5 10

<210> 558

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 558

Lys Ile Val Ile Arg Ile Arg Ala Arg Leu Ile Arg Ile Arg Ile Arg
1 5 10 15

<210> 559

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 559

Arg Ile Ile Val Lys Ile Arg Leu Arg Ile Ile Lys Lys Ile Arg Leu
1 5 10 15

<210> 560

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 560

Lys Ile Gly Ile Lys Ala Arg Val Arg Ile Ile Arg Val Lys Ile Ile
1 5 10 15

<210> 561

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 561

Arg Ile Ile Val His Ile Arg Leu Arg Ile Ile His His Ile Arg Leu
1 5 10 15

<210> 562

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 562

His	Ile	Gly	Ile	Lys	Ala	His	Val	Arg	Ile	Ile	Arg	Val	His	Ile	Ile
1				5				10					15		

<210> 563

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 563

Arg	Ile	Tyr	Val	Lys	Ile	His	Leu	Arg	Tyr	Ile	Lys	Lys	Ile	Arg	Leu
1				5				10					15		

<210> 564

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 564

Lys	Ile	Gly	His	Lys	Ala	Arg	Val	His	Ile	Ile	Arg	Tyr	Lys	Ile	Ile
1				5				10					15		

<210> 565

<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 565
Arg Ile Tyr Val Lys Pro His Pro Arg Tyr Ile Lys Lys Ile Arg Leu
1 5 10 15

<210> 566
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 566
Lys Pro Gly His Lys Ala Arg Pro His Ile Ile Arg Tyr Lys Ile Ile
1 5 10 15

<210> 567
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 567
Lys Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg Ile Arg Ile Arg
1 5 10 15

Lys Ile Val

<210> 568

<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 568
Arg Ile Ile Val Lys Ile Arg Leu Arg Ile Ile Lys Lys Ile Arg Leu
1 5 10 15

Ile Lys Lys

<210> 569
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 569
Lys Ile Gly Trp Lys Leu Arg Val Arg Ile Ile Arg Val Lys Ile Gly
1 5 10 15

Arg Leu Arg

<210> 570
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 570
Lys Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg Ile Arg Ile Arg
1 5 10 15

Lys Ile Val Lys Val Lys Arg Ile Arg
20 25

<210> 571

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 571

Arg Phe Ala Val Lys Ile Arg Leu Arg Ile Ile Lys Lys Ile Arg Leu
1 5 10 15

Ile Lys Lys Ile Arg Lys Arg Val Ile Lys
20 25

<210> 572

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 572

Lys Ala Gly Trp Lys Leu Arg Val Arg Ile Ile Arg Val Lys Ile Gly
1 5 10 15

Arg Leu Arg Lys Ile Gly Trp Lys Lys Arg Val Arg Ile Lys
20 25 30

<210> 573

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<400> 573

Arg Ile Tyr Val Lys Pro His Pro Arg Tyr Ile Lys Lys Ile Arg Leu
1 5 10 15

<210> 574

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 574

Lys Pro Gly His Lys Ala Arg Pro His Ile Ile Arg Tyr Lys Ile Ile
1 5 10 15

<210> 575

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 575

Lys Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg Ile Arg Ile Arg
1 5 10 15

Lys Ile Val

<210> 576

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC

PEPTIDE

<400> 576

Arg Ile Ile Val Lys Ile Arg Leu Arg Ile Ile Lys Lys Ile Arg Leu
1 5 10 15

Ile Lys Lys

<210> 577

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 577

Arg Ile Tyr Val Ser Lys Ile Ser Ile Tyr Ile Lys Lys Ile Arg Leu
1 5 10 15

<210> 578

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 578

Lys Ile Val Ile Phe Thr Arg Ile Arg Leu Thr Ser Ile Arg Ile Arg
1 5 10 15

Ser Ile Val

<210> 579

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 579

Lys Pro Ile His Lys Ala Arg Pro Thr Ile Ile Arg Tyr Lys Met Ile
1 5 10 15

<210> 580

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, disulfide bond to position 26

<220>

<223> At position 26, disulfide bond to position 1

<400> 580

Xaa Cys Lys Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro
1 5 10 15

Leu Phe Lys Thr Leu Leu Ser Ala Val Cys
20 25

<210> 581

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 581

Cys Lys Lys Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser Pro
1 5 10 15

Leu Phe Lys Thr Leu Leu Ser Ala Val Cys
20 25

<210> 582

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 582

Cys Lys Lys Lys Gly Phe Phe Ala Leu Ile Pro Lys Ile Ile Ser Ser
1 5 10 15

Pro Leu Phe Lys Thr Leu Leu Ser Ala Val Cys
20 25

<210> 583

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, disulfide bond to position 17

<220>

<223> At position 17, disulfide bond to position 1

<400> 583

Xaa Cys Arg Ile Val Ile Arg Ile Arg Ile Arg Leu Ile Arg Ile Arg
1 5 10 15

Cys

<210> 584

<211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:VIP MIMETIC
 PEPTIDE

<220>
 <223> At position 1, disulfide bond to position 19

<220>
 <223> At position 19, disulfide bond to position 1

<400> 584
 Xaa Cys Lys Pro Gly His Lys Ala Arg Pro His Ile Ile Arg Tyr Lys
 1 5 10 15

Ile Ile Cys

<210> 585
 <211> 29
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:VIP MIMETIC
 PEPTIDE

<220>
 <223> At position 1, disulfide bond to position 29

<220>
 <223> At position 29, disulfide bond to position 1

<400> 585
 Xaa Cys Arg Phe Ala Val Lys Ile Arg Leu Arg Ile Ile Lys Lys Ile
 1 5 10 15

Arg Leu Ile Lys Lys Ile Arg Lys Arg Val Ile Lys Cys
 20 25

<210> 586

<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 586
Lys Leu Leu Leu Lys Leu Leu Leu Lys Leu Leu Lys Cys
1 5 10

<210> 587
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 587
Lys Leu Leu Leu Lys Leu Leu Leu Lys Leu Leu Lys
1 5 10

<210> 588
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 588
Lys Leu Leu Leu Lys Leu Lys Leu Lys Leu Leu Lys Cys
1 5 10

<210> 589
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 589

Lys Leu Leu Leu Lys Leu Leu Leu Lys Leu Leu Lys
1 5 10

<210> 590

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 590

His Ser Asp Ala Val Phe Tyr Asp Asn Tyr Thr Arg Leu Arg Lys Gln
1 5 10 15Met Ala Val Lys Lys Tyr Leu Asn Ser Ile Leu Asn
20 25

<210> 591

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 591

Asn Leu Glu His Ser Asp Ala Val Phe Tyr Asp Asn Tyr Thr Arg Leu
1 5 10 15Arg Lys Gln Met Ala Val Lys Lys Tyr Leu Asn Ser Ile Leu Asn
20 25 30

<210> 592

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is absent or is ala, val,
ala-val, val-ala, L-lys, D-lys, ala-lys, val-lys,
ala-val-lys, val-ala-lys, or an ornithinyl residue

<220>

<223> At position 2, Xaa is L-lys, D-lys or an
ornithinyl residue

<220>

<223> At position 3, Xaa is L-tyr, D-tyr, phe, trp or a
p-aminophenylalanyl residue

<220>

<223> At position 4, Xaa is a hydrophobic aliphatic
amino acid residue (X5), X5-leu, X5-norleucyl,
X5-D-ala, X5-asn-ser, X5-asn-ser-ile,
X5-asn-ser-tyr, X5-asn-ser-ile-leu,
X5-asn-ser-tyr-leu,

<220>

<223> or X5-asn-ser-tyr-leu-asn

<400> 592

Xaa Xaa Xaa Xaa

1

<210> 593

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is either absent, a hydrophobic

aliphatic residue (X5), X5-asn, tyr-X5, lys-X5,
 lyx-S5-asn, lys-tyr-X5, lys-tyr-X5-as,
 lys-lys-tyr-X5, lys-lys-tyr-X5-asn,
 val-lys-lys-tyr-X5,

<220>

<223> val-ala-lys-lys-tyr-X5-asn, or
 ala-val-lys-lys-tyr-X5-asn

<220>

<223> At position 3, Xaa is ile or tyr

<400> 593

Xaa Ser Xaa Leu Asn
 1 5

<210> 594

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
 PEPTIDE

<220>

<223> At positions 1 and 6, Xaa are cross-linked amino
 acid residues in which the sidechain linker group
 is (CH₂)_m-Z-(CH₂)_n wherein Z is -CONH-, -NHCO-,
 -S-S-, -S(CH₂)_tCO-NH or -NH-CO(CH₂)_tS-; m is 1 or
 2

<220>

<223> when Z is -NH-CO- or -NH-CO(CH₂)_tS-; n is 1 or 2
 when Z is -NH-CO-, -S-S- or -NH-CO(CH₂)_tS, or n is
 2, 3 or 4 when Z is -CONH- or -S(CH₂)_tCO-NH-

<220>

<223> At position 5, Xaa is a hydrophobic aliphatic
 amino acid residue

<220>

<223> At position 7, Xaa is a covalent bond or Asn, Ser,
 Ile, Tyr, Leu, Asn-Ser, Asn-Ser-Ile, Asn-Ser-Tyr,
 Asn-Ser-Ile-Leu, Asn-Ser-Tyr-Leu,
 Asn-Ser-Ile-Leu-Asn or Asn-Ser-Tyr-Leu-Asn

<400> 594

Xaa Lys Lys Tyr Xaa Xaa Xaa

1

5

<210> 595

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 595

Lys Lys Tyr Leu

1

<210> 596

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 596

Asn Ser Ile Leu Asn

1

5

<210> 597

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 597

Lys Lys Tyr Leu

1

<210> 598

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 4, D amino acid residue

<400> 598

Lys Lys Tyr Ala

1

<210> 599

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 599

Ala Val Lys Lys Tyr Leu

1

5

<210> 600

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 600

Asn Ser Ile Leu Asn

1

5

<210> 601

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 601

Lys Lys Tyr Val

1

<210> 602

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 3, Xaa is a lauric acid residue

<400> 602

Ser Ile Xaa Asn

1

<210> 603

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 5, Xaa is a norleucyl residue

<400> 603

Lys Lys Tyr Leu Xaa

1

5

<210> 604

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 604

Asn Ser Tyr Leu Asn

1

5

<210> 605

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 605

Asn Ser Ile Tyr Asn

1

5

<210> 606

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 606

Lys Lys Tyr Leu Pro Pro Asn Ser Ile Leu Asn

1

5

10

<210> 607

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is a lauric acid residue

<400> 607

Xaa Lys Lys Tyr Leu

1

5

<210> 608

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 1, Xaa is a caproic acid residue

<400> 608

Xaa Lys Lys Tyr Leu

1

5

<210> 609

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 4, Xaa is a norleucyl residue

<400> 609

Lys Lys Tyr Xaa

1

<210> 610

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 610

Val Lys Lys Tyr Leu

1

5

<210> 611

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 611

Leu Asn Ser Ile Leu Asn

1

5

<210> 612

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 612

Tyr Leu Asn Ser Ile Leu Asn

1

5

<210> 613

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 613

Lys Lys Tyr Leu Asn

1

5

<210> 614

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 614

Lys Lys Tyr Leu Asn Ser

1

5

<210> 615

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 615

Lys Lys Tyr Leu Asn Ser Ile

1

5

<210> 616

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 616

Lys Lys Tyr Leu Asn Ser Ile Leu

1

5

<210> 617

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 617

Lys Lys Tyr Leu

1

<210> 618

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 618

Lys Lys Tyr Asp Ala

1

5

<210> 619
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 619
Ala Val Lys Lys Tyr Leu
1 5

<210> 620
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 620
Asn Ser Ile Leu Asn
1 5

<210> 621
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 621
Lys Lys Tyr Val
1

...

<210> 622
<211> 4

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>
<223> At position 3, Xaa is a lauric acid residue

<400> 622
Ser Ile Xaa Asn
1

<210> 623
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 623
Asn Ser Tyr Leu Asn
1 5

<210> 624
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 624
Asn Ser Ile Tyr Asn
1 5

<210> 625
<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 5, Xaa is a norleucyl residue

<400> 625

Lys Lys Tyr Leu Xaa
1 5

<210> 626

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 626

Lys Lys Tyr Leu Pro Pro Asn Ser Ile Leu Asn
1 5 10

<210> 627

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 627

Lys Lys Tyr Leu
1

<210> 628

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 628

Lys Lys Tyr Asp Ala
1 5

<210> 629

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 629

Ala Val Lys Lys Tyr Leu
1 5

<210> 630

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 630

Asn Ser Ile Leu Asn
1 5

<210> 631

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 631

Lys Lys Tyr Val

1

<210> 632

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 3, Xaa is a lauric acid residue.

<400> 632

Ser Ile Xaa Asn

1

<210> 633

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 633

Leu Ala Lys Lys Tyr Leu

1

5

<210> 634

<211> 7

<212> PRT..

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 634

Cys Ala Pro Lys Lys Tyr Leu

1

5

<210> 635

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 4, Xaa is a norleucyl residue

<400> 635

Lys Lys Tyr Xaa

1

<210> 636

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 636

Val Lys Lys Tyr Leu

1

5

<210> 637

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 637

Leu Asn Ser Ile Leu Asn
1 5

<210> 638

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 638

Tyr Leu Asn Ser Ile Leu Asn
1 5

<210> 639

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 5, Xaa is a norleucyl residue

<400> 639

Lys Lys Tyr Leu Xaa
1 5

<210> 640

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 640

Lys Lys Tyr Leu Asn
1 5

<210> 641

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 641

Lys Lys Tyr Leu Asn Ser
1 5

<210> 642

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 642

Lys Lys Tyr Leu Asn Ser Ile
1 5

<210> 643

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 643

Lys Lys Tyr Leu Asn Ser Ile Leu

1

5

<210> 644

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 644

Lys Lys Lys Tyr Leu Asp

1

5

<210> 645

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 1, 6 disulfide cross-linked

<400> 645

Xaa Cys Lys Lys Tyr Leu Cys

1

5

<210> 646

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At positions 1, 6 cross-linked by S-CH₂-CO

<400> 646

Cys Lys Lys Tyr Leu Lys

1

5

<210> 647

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<220>

<223> At position 4, D amino acid residue

<400> 647

Lys Lys Tyr Ala

1

<210> 648

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 648

Trp Trp Thr Asp Thr Gly Leu Trp

1

5

<210> 649

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 649

Trp Trp Thr Asp Asp Gly Leu Trp
1 5

<210> 650

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 650

Trp Trp Asp Thr Arg Gly Leu Trp Val Trp Thr Ile
1 5 10

<210> 651

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 651

Phe Trp Gly Asn Asp Gly Ile Trp Leu Glu Ser Gly
1 5 10

<210> 652

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 652

Asp Trp Asp Gln Phe Gly Leu Trp Arg Gly Ala Ala
1 5 10

<210> 653

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 653

Arg Trp Asp Asp Asn Gly Leu Trp Val Val Val Leu
1 5 10

<210> 654

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VIP MIMETIC
PEPTIDE

<400> 654

Ser Gly Met Trp Ser His Tyr Gly Ile Trp Met Gly
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Gly Gly Arg Trp Asp Gln Ala Gly Leu Trp Val Ala

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Lys Leu Trp Ser Glu Gln Gly Ile Trp Met Gly Glu
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Cys Trp Ser Met His Gly Leu Trp Leu Cys
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Gly Cys Trp Asp Asn Thr Gly Ile Trp Val Pro Cys
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Asp Trp Asp Thr Arg Gly Leu Trp Val Tyr
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Ser Leu Trp Asp Glu Asn Gly Ala Trp Ile
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Lys Trp Asp Asp Arg Gly Leu Trp Met His
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Gln Ala Trp Asn Glu Arg Gly Leu Trp Thr
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Gln Trp Asp Thr Arg Gly Leu Trp Val Ala
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Trp Asn Val His Gly Ile Trp Gln Glu
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Ser Trp Asp Thr Arg Gly Leu Trp Val Glu
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Asp Trp Asp Thr Arg Gly Leu Trp Val Ala
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PEPTIDE

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Ser Trp Gly Arg Asp Gly Leu Trp Ile Glu
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PEPTIDE

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Glu Trp Thr Asp Asn Gly Leu Trp Ala Leu
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Ser Trp Asp Glu Lys Gly Leu Trp Ser Ala
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Ser Trp Asp Ser Ser Gly Leu Trp Met Asp
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Ser His Leu Tyr Trp Gln Pro Tyr Ser Val Gln

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Val His Val Tyr Trp Gln Pro Tyr Ser Val Gln Thr
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Arg Leu Val Tyr Trp Gln Pro Tyr Ser Val Gln Thr
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Ser Arg Val Trp Phe Gln Pro Tyr Ser Leu Gln Ser
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Asn Met Val Tyr Trp Gln Pro Tyr Ser Ile Gln Thr
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Ser Val Val Phe Trp Gln Pro Tyr Ser Val Gln Thr
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Thr Phe Val Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
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Thr Leu Val Tyr Trp Gln Pro Tyr Ser Ile Gln Arg
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Arg Leu Val Tyr Trp Gln Pro Tyr Ser Val Gln Arg
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Ser Pro Val Phe Trp Gln Pro Tyr Ser Ile Gln Ile
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Trp Ile Glu Trp Trp Gln Pro Tyr Ser Val Gln Ser
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Ser Leu Ile Tyr Trp Gln Pro Tyr Ser Leu Gln Met
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Arg Cys Asp Tyr Trp Gln Pro Tyr Ser Val Gln Thr
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<211> 12

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Met Arg Val Phe Trp Gln Pro Tyr Ser Val Gln Asn

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Lys Ile Val Tyr Trp Gln Pro Tyr Ser Val Gln Thr
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Arg His Leu Tyr Trp Gln Pro Tyr Ser Val Gln Arg
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Asp Leu Arg Tyr Trp Gln Pro Tyr Ser Val Gln Val
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Glu Leu Val Trp Trp Gln Pro Tyr Ser Leu Gln Leu
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Glu Leu Val Tyr Trp Gln Pro Tyr Ser Ile Gln Arg
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Glu Leu Met Tyr Trp Gln Pro Tyr Ser Val Gln Glu
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Asn Leu Leu Tyr Trp Gln Pro Tyr Ser Met Gln Asp
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Gly Tyr Glu Trp Tyr Gln Pro Tyr Ser Val Gln Arg
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Ser Arg Val Trp Tyr Gln Pro Tyr Ser Val Gln Arg
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Leu Ser Glu Gln Tyr Gln Pro Tyr Ser Val Gln Arg

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Gly Gly Gly Trp Trp Gln Pro Tyr Ser Val Gln Arg

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Val Gly Arg Trp Tyr Gln Pro Tyr Ser Val Gln Arg

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<211> 12

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Val His Val Tyr Trp Gln Pro Tyr Ser Val Gln Arg

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<211> 12

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<400> 707

Gln Ala Arg Trp Tyr Gln Pro Tyr Ser Val Gln Arg
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Val His Val Tyr Trp Gln Pro Tyr Ser Val Gln Thr
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<400> 709

Arg Ser Val Tyr Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

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Thr Arg Val Trp Phe Gln Pro Tyr Ser Val Gln Arg
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<400> 711

Gly Arg Ile Trp Phe Gln Pro Tyr Ser Val Gln Arg
1 5 10

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<400> 712

Gly Arg Val Trp Phe Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 713

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<400> 713

Ala Arg Thr Trp Tyr Gln Pro Tyr Ser Val Gln Arg
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<400> 714

Ala Arg Val Trp Trp Gln Pro Tyr Ser Val Gln Met
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<400> 715

Arg Leu Met Phe Tyr Gln Pro Tyr Ser Val Gln Arg
1 5 10

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<400> 716

Glu Ser Met Trp Tyr Gln Pro Tyr Ser Val Gln Arg
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<400> 717

His Phe Gly Trp Trp Gln Pro Tyr Ser Val His Met
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<400> 718

Ala Arg Phe Trp Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

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Arg Leu Val Tyr Trp Gln Pro Tyr Ala Pro Ile Tyr

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Arg Leu Val Tyr Trp Gln Pro Tyr Ser Tyr Gln Thr
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Arg Leu Val Tyr Trp Gln Pro Tyr Ser Leu Pro Ile
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Arg Leu Val Tyr Trp Gln Pro Tyr Ser Val Gln Ala
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Ser Arg Val Trp Tyr Gln Pro Tyr Ala Lys Gly Leu
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Ser Arg Val Trp Tyr Gln Pro Tyr Ala Gln Gly Leu
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Ser Arg Val Trp Tyr Gln Pro Tyr Ala Met Pro Leu
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Ser Arg Val Trp Tyr Gln Pro Tyr Ser Val Gln Ala
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Ser Arg Val Trp Tyr Gln Pro Tyr Ser Leu Gly Leu
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Ser Arg Val Trp Tyr Gln Pro Tyr Ala Arg Glu Leu
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Ser Arg Val Trp Tyr Gln Pro Tyr Ser Arg Gln Pro
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Glu Tyr Glu Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
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<400> 732

Ile Pro Glu Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
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Ser Arg Ile Trp Trp Gln Pro Tyr Ala Leu Pro Leu
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Asp Pro Leu Phe Trp Gln Pro Tyr Ala Leu Pro Leu
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Ser Arg Gln Trp Val Gln Pro Tyr Ala Leu Pro Leu

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Ile Arg Ser Trp Trp Gln Pro Tyr Ala Leu Pro Leu

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<400> 737

Arg Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu

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Arg Leu Leu Trp Val Gln Pro Tyr Ala Leu Pro Leu

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Glu Tyr Arg Trp Phe Gln Pro Tyr Ala Leu Pro Leu
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Asp Ser Ser Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
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Ile Gly Asn Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
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Asn Leu Arg Trp Asp Gln Pro Tyr Ala Leu Pro Leu
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Leu Pro Glu Phe Trp Gln Pro Tyr Ala Leu Pro Leu
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Asp Ser Tyr Trp Trp Gln Pro Tyr Ala Leu Pro Leu
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Ala Arg Phe Trp Leu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 751

Asn Ser Tyr Phe Trp Gln Pro Tyr Ala Leu Pro Leu

1 5 10

<210> 752

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 752

Arg Phe Met Tyr Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 753

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 753

Ala His Leu Phe Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 754

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 754

Trp Trp Gln Pro Tyr Ala Leu Pro Leu
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PEPTIDE

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Tyr Tyr Gln Pro Tyr Ala Leu Pro Leu
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PEPTIDE

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Tyr Phe Gln Pro Tyr Ala Leu Gly Leu
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PEPTIDE

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Tyr Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 758

<211> 10

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PEPTIDE

<400> 758

Arg Trp Trp Gln Pro Tyr Ala Thr Pro Leu
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PEPTIDE

<400> 759

Gly Trp Tyr Gln Pro Tyr Ala Leu Gly Phe
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<210> 760

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 760

Tyr Trp Tyr Gln Pro Tyr Ala Leu Gly Leu
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<210> 761

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PEPTIDE

<400> 761

Ile Trp Tyr Gln Pro Tyr Ala Met Pro Leu
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<210> 762

<211> 10

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 762

Ser Asn Met Gln Pro Tyr Gln Arg Leu Ser
1 5 10

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<211> 20

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 763

Thr Phe Val Tyr Trp Gln Pro Tyr Ala Val Gly Leu Pro Ala Ala Glu
1 5 10 15Thr Ala Cys Asn
20

<210> 764

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PEPTIDE

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Thr Phe Val Tyr Trp Gln Pro Tyr Ser Val Gln Met Thr Ile Thr Gly
1 5 10 15Lys Val Thr Met
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<210> 765

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<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 765

Thr Phe Val Tyr Trp Gln Pro Tyr Ser Ser His Xaa Xaa Val Pro Xaa
1 5 10 15Gly Phe Pro Leu
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<210> 766

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<212> PRT

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Thr Phe Val Tyr Trp Gln Pro Tyr Tyr Gly Asn Pro Gln Trp Ala Ile
1 5 10 15His Val Arg His
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<210> 767
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PEPTIDE

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Thr Phe Val Tyr Trp Gln Pro Tyr Val Leu Leu Glu Leu Pro Glu Gly
1 5 10 15

Ala Val Arg Ala
20

<210> 768
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PEPTIDE

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Thr Phe Val Tyr Trp Gln Pro Tyr Val Asp Tyr Val Trp Pro Ile Pro
1 5 10 15

Ile Ala Gln Val
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<210> 769
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PEPTIDE

<400> 769
Gly Trp Tyr Gln Pro Tyr Val Asp Gly Trp Arg

1 5 10

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<400> 770
Arg Trp Glu Gln Pro Tyr Val Lys Asp Gly Trp Ser
1 5 10

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<400> 771
Glu Trp Tyr Gln Pro Tyr Ala Leu Gly Trp Ala Arg
1 5 10

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Gly Trp Trp Gln Pro Tyr Ala Arg Gly Leu
1 5 10

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<211> 12

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Leu Phe Glu Gln Pro Tyr Ala Lys Ala Leu Gly Leu
1 5 10

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<211> 12

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Gly Trp Glu Gln Pro Tyr Ala Arg Gly Leu Ala Gly
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PEPTIDE

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Ala Trp Val Gln Pro Tyr Ala Thr Pro Leu Asp Glu
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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 776

Met Trp Tyr Gln Pro Tyr Ser Ser Gln Pro Ala Glu
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<210> 777

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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Gly Trp Thr Gln Pro Tyr Ser Gln Gln Gly Glu Val
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Asp Trp Phe Gln Pro Tyr Ser Ile Gln Ser Asp Glu
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<210> 779

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 779

Pro Trp Ile Gln Pro Tyr Ala Arg Gly Phe Gly
1 5 10

<210> 780

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

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Arg Pro Leu Tyr Trp Gln Pro Tyr Ser Val Gln Val
1 5 10

<210> 781

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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Thr Leu Ile Tyr Trp Gln Pro Tyr Ser Val Gln Ile
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<210> 782

<211> 12

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Arg Phe Asp Tyr Trp Gln Pro Tyr Ser Asp Gln Thr
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<210> 783

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 783

Trp His Gln Phe Val Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 784

<211> 17

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 784

Glu Trp Asp Ser Val Tyr Trp Gln Pro Tyr Ser Val Gln Thr Leu Leu
1 5 10 15

Arg

<210> 785

<211> 17

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 785

Trp Glu Gln Asn Val Tyr Trp Gln Pro Tyr Ser Val Gln Ser Phe Ala
1 5 10 15

Asp

<210> 786

<211> 16

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 786

Ser Asp Val Val Tyr Trp Gln Pro Tyr Ser Val Gln Ser Leu Glu Met
1 5 10 15

<210> 787

<211> 17

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 787

Tyr Tyr Asp Gly Val Tyr Trp Gln Pro Tyr Ser Val Gln Val Met Pro
1 5 10 15

Ala

<210> 788

<211> 12

<212> PRT

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PEPTIDE

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Ser Asp Ile Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 789

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
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<400> 789

Gln Arg Ile Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 790

<211> 12

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PEPTIDE

<400> 790

Ser Arg Ile Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 791

<211> 12

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<400> 791

Arg Ser Leu Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
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<210> 792

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PEPTIDE

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Thr Ile Ile Trp Glu Gln Pro Tyr Ala Leu Pro Leu
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<211> 12

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Trp Glu Thr Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 794

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Ser Tyr Asp Trp Glu Gln Pro Tyr Ala Leu Pro Leu

1 5 10

<210> 795

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 795

Ser Arg Ile Trp Cys Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 796

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 796

Glu Ile Met Phe Trp Gln Pro Tyr Ala Leu Pro Leu
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<210> 797

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 797

Asp Tyr Val Trp Gln Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 798
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PEPTIDE

<400> 798
Met Asp Leu Leu Val Gln Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 799
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PEPTIDE

<400> 799
Gly Ser Lys Val Ile Leu Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 800
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<212> PRT
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PEPTIDE

<400> 800
Arg Gln Gly Ala Asn Ile Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 801
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<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 801

Gly Gly Gly Asp Glu Pro Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 802

<211> 15

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 802

Ser Gln Leu Glu Arg Thr Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 803

<211> 15

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 803

Glu Thr Trp Val Arg Glu Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 804

<211> 15

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 804

Lys Lys Gly Ser Thr Gln Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 805

<211> 15

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 805

Leu Gln Ala Arg Met Asn Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 806

<211> 15

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 806

Glu Pro Arg Ser Gln Lys Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 807

<211> 15

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 807

Val Lys Gln Lys Trp Arg Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 808

<211> 15

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 808

Leu Arg Arg His Asp Val Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 809

<211> 15

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 809

Arg Ser Thr Ala Ser Ile Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 810

<211> 15

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 810

Glu Ser Lys Glu Asp Gln Trp Tyr Gln Pro Tyr Ala Leu Pro Leu

1 5 10 15

<210> 811

<211> 15

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 811

Glu Gly Ser Arg Glu Gly Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 812

<211> 15

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<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 812

Glu Gly Ser Arg Glu Gly Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 813

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 813

Val Ile Glu Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 814
<211> 12
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<220>
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<400> 814
Val Trp Tyr Trp Glu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 815
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PEPTIDE

<400> 815
Ala Ser Glu Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 816
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PEPTIDE

<400> 816
Phe Tyr Glu Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 817
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<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 817

Glu Gly Trp Trp Val Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 818

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 818

Trp Gly Glu Trp Leu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 819

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 819

Asp Tyr Val Trp Glu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 820

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 820

Ala His Thr Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 821

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 821

Phe Ile Glu Trp Phe Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 822

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 822

Trp Leu Ala Trp Glu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 823

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 823

Val Met Glu Trp Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 824

<211> 11

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 824

Glu Arg Met Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 825

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 825

Asn Xaa Xaa Trp Xaa Xaa Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 826

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 826

Trp Gly Asn Trp Tyr Gln Pro Tyr Ala Leu Pro Leu

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10

<210> 827

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 827

Thr Leu Tyr Trp Glu Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 828

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 828

Val Trp Arg Trp Glu Gln Pro Tyr Ala Leu Pro Leu
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<210> 829

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 829

Leu Leu Trp Thr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 830

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 830

Ser Arg Ile Trp Xaa Xaa Pro Tyr Ala Leu Pro Leu
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<210> 831

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 831

Ser Asp Ile Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
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<210> 832

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 832

Trp Gly Tyr Tyr Xaa Xaa Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 833

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 833

Thr Ser Gly Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 834

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 834

Val His Pro Tyr Xaa Xaa Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 835

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 835

Glu His Ser Tyr Phe Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 836

<211> 12

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 836

Xaa Xaa Ile Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
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<210> 837

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 837

Ala Gln Leu His Ser Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 838

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 838

Trp Ala Asn Trp Phe Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 839

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 839

Ser Arg Leu Tyr Ser Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 840

<211> 12

<212> PRT

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 840

Gly Val Thr Phe Ser Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 841

<211> 12

<212> PRT

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PEPTIDE

<400> 841

Ser Ile Val Trp Ser Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 842

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 842

Ser Arg Asp Leu Val Gln Pro Tyr Ala Leu Pro Leu

1 5 10

<210> 843

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 843

His Trp Gly His Val Tyr Trp Gln Pro Tyr Ser Val Gln Asp Asp Leu
1 5 10 15

Gly

<210> 844

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 844

Ser Trp His Ser Val Tyr Trp Gln Pro Tyr Ser Val Gln Ser Val Pro
1 5 10 15

Glu

<210> 845

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 845

Trp Arg Asp Ser Val Tyr Trp Gln Pro Tyr Ser Val Gln Pro Glu Ser
1 5 10 15

Ala

<210> 846

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 846

Thr Trp Asp Ala Val Tyr Trp Gln Pro Tyr Ser Val Gln Lys Trp Leu
1 5 10 15

Asp

<210> 847

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 847

Thr Pro Pro Trp Val Tyr Trp Gln Pro Tyr Ser Val Gln Ser Leu Asp
1 5 10 15

Pro

<210> 848

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 848

Tyr Trp Ser Ser Val Tyr Trp Gln Pro Tyr Ser Val Gln Ser Val His
1 5 10 15

Ser

<210> 849

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 849

Tyr Trp Tyr Gln Pro Tyr Ala Leu Gly Leu
1 5 10

<210> 850

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 850

Tyr Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 851

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 851

Glu Trp Ile Gln Pro Tyr Ala Thr Gly Leu
1 5 10

<210> 852

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 852

Asn Trp Glu Gln Pro Tyr Ala Lys Pro Leu
1 5 10

<210> 853

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 853

Ala Phe Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 854

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 854

Phe Leu Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10

<210> 855

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 855

Val Cys Lys Gln Pro Tyr Leu Glu Trp Cys
1 5 10

<210> 856

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 856

Glu Thr Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 857

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 857

Gln Gly Trp Leu Thr Trp Gln Asp Ser Val Asp Met Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 858

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 858

Phe Ser Glu Ala Gly Tyr Thr Trp Pro Glu Asn Thr Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 859

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 859

Thr Glu Ser Pro Gly Gly Leu Asp Trp Ala Lys Ile Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 860
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 860
Asp Gly Tyr Asp Arg Trp Arg Gln Ser Gly Glu Arg Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 861
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 861
Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 862
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 862
Ser Val Gly Glu Asp His Asn Phe Trp Thr Ser Glu Tyr Trp Gln Pro

1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 863

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 863

Met Asn Asp Gln Thr Ser Glu Val Ser Thr Phe Pro Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 864

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 864

Ser Trp Ser Glu Ala Phe Glu Gln Pro Arg Asn Leu Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 865

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 865

Gln Tyr Ala Glu Pro Ser Ala Leu Asn Asp Trp Gly Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 866

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 866

Asn Gly Asp Trp Ala Thr Ala Asp Trp Ser Asn Tyr Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 867

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 867

Thr His Asp Glu His Ile Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 868

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 868

Met Leu Glu Lys Thr Tyr Thr Thr Trp Thr Pro Gly Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 869

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 869

Trp Ser Asp Pro Leu Thr Arg Asp Ala Asp Leu Tyr Trp Gln Pro Tyr
1 5 10 15

Ala Leu Pro Leu
20

<210> 870

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 870

Ser Asp Ala Phe Thr Thr Gln Asp Ser Gln Ala Met Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu

20

<210> 871
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 871
Gly Asp Asp Ala Ala Trp Arg Thr Asp Ser Leu Thr Tyr Trp Gln Pro
1 5 10 15
Tyr Ala Leu Pro Leu
20

<210> 872
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 872
Ala Ile Ile Arg Gln Leu Tyr Arg Trp Ser Glu Met Tyr Trp Gln Pro
1 5 10 15
Tyr Ala Leu Pro Leu
20

<210> 873
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 873

Glu Asn Thr Tyr Ser Pro Asn Trp Ala Asp Ser Met Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 874

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 874

Met Asn Asp Gln Thr Ser Glu Val Ser Thr Phe Pro Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 875

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 875

Ser Val Gly Glu Asp His Asn Phe Trp Thr Ser Glu Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 876

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 876

Gln Thr Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 877

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 877

Glu Asn Pro Phe Thr Trp Gln Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 878

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 878

Val Thr Pro Phe Thr Trp Glu Asp Ser Asn Val Phe Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu

20

<210> 879
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 879
Gln Ile Pro Phe Thr Trp Glu Gln Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15
Tyr Ala Leu Pro Leu
20

<210> 880
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 880
Gln Ala Pro Leu Thr Trp Gln Glu Ser Ala Ala Tyr Tyr Trp Gln Pro
1 5 10 15
Tyr Ala Leu Pro Leu
20

<210> 881
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 881

Glu Pro Thr Phe Thr Trp Glu Glu Ser Lys Ala Thr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 882

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 882

Thr Thr Thr Leu Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 883

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 883

Glu Ser Pro Leu Thr Trp Glu Glu Ser Ser Ala Leu Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 884

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 884

Glu Thr Pro Leu Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 885

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 885

Glu Ala Thr Phe Thr Trp Ala Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 886

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 886

Glu Ala Leu Phe Thr Trp Lys Glu Ser Thr Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu

20

<210> 887
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 887
Ser Thr Pro Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro Tyr
1 5 10 15

Ala Leu Pro Leu
20

<210> 888
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 888
Glu Thr Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 889
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 889

Lys Ala Pro Phe Thr Trp Glu Glu Ser Gln Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 890

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 890

Ser Thr Ser Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 891

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 891

Asp Ser Thr Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 892

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 892

Tyr Ile Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 893

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 893

Gln Thr Ala Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 894

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 894

Glu Thr Leu Phe Thr Trp Glu Glu Ser Asn Ala Thr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu

20

<210> 895

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 895

Val Ser Ser Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15Tyr Ala Leu Pro Leu
20

<210> 896

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 896

Gln Pro Tyr Ala Leu Pro Leu
1 5

<210> 897

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is a phosphotyrosyl residue

<220>

<223> At position 2, Xaa is a 1-napthylalanyl residue

<220>

<223> At position 6, Xaa is an azetidine residue

<400> 897

Xaa Xaa Pro Tyr Gln Xaa Tyr Ala Leu Pro Leu
1 5 10

<210> 898

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 898

Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 899

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 899

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 900

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 900

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Trp	Gln	Xaa	Tyr	Ala	Leu	Pro	Leu
1				5				10					15	

<210> 901

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 901

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr	Ala	Leu	Pro	Leu
1				5				10					15	

<210> 902

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 902

Glu	Thr	Pro	Phe	Thr	Trp	Glu	Glu	Ser	Asn	Ala	Tyr	Tyr	Trp	Gln	Pro
1				5					10					15	

Tyr Ala Leu Pro Leu

20

<210> 903

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 13, Xaa is an azetidine residue

<400> 903

Phe	Thr	Trp	Glu	Glu	Ser	Asn	Ala	Tyr	Tyr	Trp	Gln	Xaa	Tyr	Ala	Leu
1				5					10					15	

Pro Leu

<210> 904

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 904

Ala	Asp	Val	Leu	Tyr	Trp	Gln	Pro	Tyr	Ala	Pro	Val	Thr	Leu	Trp	Val
1				5					10					15	

<210> 905

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 905

Gly Asp Val Ala Glu Tyr Trp Gln Pro Tyr Ala Leu Pro Leu Thr Ser
1 5 10 15

Leu

<210> 906

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 906

Ser Trp Thr Asp Tyr Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Ile Ser
1 5 10 15

Gly Leu

<210> 907

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 4, Xaa is prolyl or an azetidine
residue

<220>

<223> At position 6, Xaa is S, A, V or L

<400> 907

Xaa Xaa Gln Xaa Tyr Xaa Xaa Xaa
1 5

<210> 908

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is Y, W or F

<220>

<223> At position 4, Xaa is prolyl or an azetidine
residue

<220>

<223> At position 6, Xaa is S, A, V or L

<400> 908

Xaa Xaa Gln Xaa Tyr Xaa Xaa Xaa
1 5

<210> 909

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is Y, W or F

<220>

<223> At position 2, Xaa is E, F, V, W or Y

<220>

<223> At position 4, Xaa is prolyl or an azetidine
residue

<220>

<223> At position 6, Xaa is S, A, V or L

<220>

<223> At position 7, Xaa is M, F, V, R, Q, K, T, S, D,
L, I or E

<220>

<223> At position 8, Xaa is E, L, W, V, H, I, G, A, D,
L, Y, N, Q or P

<400> 909

Xaa Xaa Gln Xaa Tyr Xaa Xaa Xaa
1 5

<210> 910

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is V, L, I, E, P, G, Y, M, T or
D

<220>

<223> At position 2, Xaa is Y, W or F

<220>

<223> At position 3, Xaa is E, F, V, W or Y

<220>

<223> At position 5, Xaa is prolyl or an azetidine
residue

<220>

<223> At position 7, Xaa is S, A, V or L

<220>

<223> At position 8, Xaa is M, F, V, R, Q, K, T, S, D,
L, I or E

<220>

<223> At position 9, Xaa is E, L, W, V, H, I, G, A, D,
L, Y, N, Q or P

<400> 910

Xaa Xaa Xaa Gln Xaa Tyr Xaa Xaa Xaa

1

5

<210> 911

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 911

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu

1

5

10

15

<210> 912

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 912

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr Ala Leu Pro Leu

1

5

10

15

<210> 913

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 913

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 914

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 914

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr Ala Leu Pro Leu
1 5 10 15

<210> 915

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 915

Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 916

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 916

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr	Ala	Leu	Pro	Leu
1				5				10					15	

<210> 917

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is A, D, E, F, G, K, Q, S, T, V
or Y

<220>

<223> At position 2, Xaa is A, D, G, I, N, P, S, T, V or
W

<220>

<223> At position 3, Xaa is A, D, G, L, N, P, S, T, W or
Y

<220>

<223> At position 4, Xaa is A, D, E, F, L, N, R, V or Y

<220>

<223> At position 5, Xaa is A, D, E, Q, R, S or T

<220>

<223> At position 6, Xaa is H, I, L, P, S, T or W

<220>

<223> At position 7, Xaa is A, E, F, K, N, Q, R, S or Y

<220>

<223> At position 8, Xaa is D, E, F, Q, R, T or W

<220>

<223> At position 9, Xaa is A, D, P, S, T or W

<220>

<223> At position 10, Xaa is A, D, G, K, N, Q, S or T

<220>

<223> At position 11, Xaa is A, E, L, P, S, T, V or Y

<220>

<223> At position 12, Xaa is V, L, I, E, P, G, Y, M, T
or D

<220>

<223> At position 13, Xaa is Y, W or F

<220>

<223> At position 14, Xaa is E, F, V, W or Y

<220>

<223> At position 16, Xaa is P or an azetidine residue

<220>

<223> At position 18, Xaa is S, A, V or L

<220>

<223> At position 19, Xaa is M, F, V, R, Q, K, T, S, D,
L, I or E

<220>

<223> At position 20, Xaa is Q or P

<400> 917

Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Gln	Xaa
1				5					10					15	

Tyr	Xaa	Xaa	Xaa	Leu
				20

<210> 918

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: IL-1 ANTAGONIST
PEPTIDE

<400> 918

Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 919

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 919

Ser Trp Thr Asp Tyr Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Ile Ser
1 5 10 15

Gly Leu

<210> 920

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 920

Glu Thr Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 921

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 921

Glu Asn Thr Tyr Ser Pro Asn Trp Ala Asp Ser Met Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 922

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 922

Ser Val Gly Glu Asp His Asn Phe Trp Thr Ser Glu Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 923

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 923

Asp Gly Tyr Asp Arg Trp Arg Gln Ser Gly Glu Arg Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 924
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 924
Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
1 5 10 15

<210> 925
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 925
Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Asn His
1 5 10

<210> 926
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa is an azetidine residue

<400> 926
Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr Asn His
1 5 10

<210> 927

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 927

Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Asn His
1 5 10

<210> 928

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 928

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr
1 5 10

<210> 929

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 929

Ala Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 930

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 930

Phe Ala Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 931

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 931

Phe Glu Ala Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 932

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 932

Phe	Glu	Trp	Ala	Pro	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 933

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 933

Phe	Glu	Trp	Thr	Ala	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 934

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 934

Phe	Glu	Trp	Thr	Pro	Ala	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 935
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa is an azetidine residue

<400> 935
Phe Glu Trp Thr Pro Gly Ala Trp Gln Xaa Tyr
1 5 10

<210> 936
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa is an azetidine residue

<400> 936
Phe Glu Trp Thr Pro Gly Tyr Ala Gln Xaa Tyr
1 5 10

<210> 937
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa is an azetidine residue

<400> 937

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Ala
1 5 10

<210> 938

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 938

Phe Glu Trp Thr Gly Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 939

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 939

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 940

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 940

Phe	Glu	Trp	Thr	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5				10	

<210> 941

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa is a pipecolic acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 941

Phe	Glu	Trp	Thr	Xaa	Gly	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 942

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, Xaa is an aminoisobutyric acid
residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 942

Phe Glu Trp Thr Pro Xaa Tyr Trp Gln Xaa Tyr

1

5

10

<210> 943

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 6, Xaa is a sarcosine residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 943

Phe Glu Trp Thr Pro Xaa Trp Tyr Gln Xaa Tyr

1

5

10

<210> 944

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa is a sarcosine residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 944

Phe Glu Trp Thr Xaa Gly Tyr Trp Gln Xaa Tyr

1 5 10

<210> 945

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 945

Phe Glu Trp Thr Pro Asn Tyr Trp Gln Xaa Tyr
1 5 10

<210> 946

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, D amino acid residue

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 946

Phe Glu Trp Thr Pro Val Tyr Trp Gln Xaa Tyr
1 5 10

<210> 947

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 947

Phe	Glu	Trp	Thr	Val	Pro	Tyr	Trp	Gln	Xaa	Tyr
1				5					10	

<210> 948

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is acetylated phe

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 948

Phe	Glu	Trp	Thr	Pro	Gly	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 949

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa is acetylated phe

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 949

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 950

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=1-naphthylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 950

Xaa Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr
1 5 10

<210> 951

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 951

Tyr Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr
1 5 10

<210> 952

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 952

Phe	Glu	Trp	Val	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 953

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 953

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 954

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 954

Phe	Glu	Trp	Thr	Pro	Ser	Tyr	Tyr	Gln	Xaa	Tyr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1

5

10

<210> 955

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 955

Phe Glu Trp Thr Pro Asn Tyr Tyr Gln Xaa Tyr

1

5

10

<210> 956

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=naphthylalanine

<400> 956

Ser His Leu Tyr Xaa Gln Pro Tyr Ser Val Gln Met

1

5

10

<210> 957

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=naphthylalanine

<400> 957

Thr Leu Val Tyr Xaa Gln Pro Tyr Ser Leu Gln Thr
1 5 10

<210> 958

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=naphthylalanine

<400> 958

Arg Gly Asp Tyr Xaa Gln Pro Tyr Ser Val Gln Ser
1 5 10

<210> 959

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=naphthylalanine

<400> 959

Asn Met Val Tyr Xaa Gln Pro Tyr Ser Ile Gln Thr
1 5 10

<210> 960

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 960

Val Tyr Trp Gln Pro Tyr Ser Val Gln
1 5

<210> 961

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 3, Xaa=naphthylalanine

<400> 961

Val Tyr Xaa Gln Pro Tyr Ser Val Gln
1 5

<210> 962

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 7, Xaa is an azetidine residue

<400> 962

Thr Phe Val Tyr Trp Gln Xaa Tyr Ala Leu Pro Leu
1 5 10

<210> 963

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, Xaa =p-benzoyl-L-phenylalanine

<400> 963

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Xaa
1				5					10	

<210> 964

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa is an azetidine residue

<220>

<223> At position 11, Xaa=p-benzoyl-L-phenylalanine

<400> 964

Xaa	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Xaa
1				5					10	

<210> 965

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 8, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 965

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Xaa	Gln	Xaa	Tyr
1				5					10	

<210> 966

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 8, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 966

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Xaa	Gln	Xaa	Tyr
1				5					10	

<210> 967

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 7, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 967

Phe	Glu	Trp	Thr	Pro	Gly	Xaa	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 968

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 7, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 968

Phe	Glu	Trp	Thr	Pro	Gly	Xaa	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 969

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 3, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 969

Phe	Glu	Xaa	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 970

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 3, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 970

Phe	Glu	Xaa	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 971

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 971

Xaa	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 972

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated
p-benzoyl-L-phenylalanine

<220>

<223> At position 10, Xaa is an azetidine residue

<400> 972

Xaa	Glu	Trp	Thr	Pro	Gly	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 973

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 973

Val	Tyr	Trp	Gln	Pro	Tyr	Ser	Val	Gln
1				5				

<210> 974

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 974

Arg Leu Val Tyr Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 975

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 5, Xaa=naphthylalanine

<400> 975

Arg Leu Val Tyr Xaa Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 976

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 976

Arg Leu Asp Tyr Trp Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 977
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 977
Arg Leu Val Trp Phe Gln Pro Tyr Ser Val Gln Arg
1 5 10

<210> 978
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 978
Arg Leu Val Tyr Trp Gln Pro Tyr Ser Ile Gln Arg
1 5 10

<210> 979
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 1, Xaa=D or Y

<220>
<223> At position 3, Xaa=D or S

<220>

<223> At position 4, Xaa=S, T or A

<220>

<223> At position 5, Xaa=S or W

<220>

<223> At position 6, Xaa=S or Y

<220>

<223> At position 7, Xaa=D, Q, E or V

<220>

<223> At position 8, Xaa=N, S, K, H or W

<220>

<223> At position 9, Xaa=F or L

<220>

<223> At position 10, Xaa=D, N, S or L

<220>

<223> At position 11, Xaa=L, I, Q, M or A

<400> 979

Xaa	Asn	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
1			5						10	

<210> 980

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: IL-1 ANTAGONIST
PEPTIDE

<400> 980

Asp	Asn	Ser	Ser	Trp	Tyr	Asp	Ser	Phe	Leu	Leu
1				5					10	

<210> 981

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 981

Asp Asn Thr Ala Trp Tyr Glu Ser Phe Leu Ala

1

5

10

<210> 982

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 982

Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu

1

5

10

<210> 983

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 983

Pro Ala Arg Glu Asp Asn Thr Ala Trp Tyr Asp Ser Phe Leu Ile Trp

1

5

10

15

Cys

<210> 984

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 984

Thr Ser Glu Tyr Asp Asn Thr Thr Trp Tyr Glu Lys Phe Leu Ala Ser
1 5 10 15

Gln

<210> 985

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 985

Ser Gln Ile Pro Asp Asn Thr Ala Trp Tyr Gln Ser Phe Leu Leu His
1 5 10 15

Gly

<210> 986

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 986

Ser Pro Phe Ile Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Thr
1 5 10 15

Tyr

<210> 987

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 987

Glu Gln Ile Tyr Asp Asn Thr Ala Trp Tyr Asp His Phe Leu Leu Ser
1 5 10 15

Tyr

<210> 988

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 988

Thr Pro Phe Ile Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Thr
1 5 10 15

Tyr

<210> 989

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 989

Thr Tyr Thr Tyr Asp Asn Thr Ala Trp Tyr Glu Arg Phe Leu Met Ser
1 5 10 15

Tyr

<210> 990

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 990

Thr Met Thr Gln Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Ser
1 5 10 15

Tyr

<210> 991

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 991

Thr Ile Asp Asn Thr Ala Trp Tyr Ala Asn Leu Val Gln Thr Tyr Pro
1 5 10 15

Gln

<210> 992

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 992

Thr Ile Asp Asn Thr Ala Trp Tyr Glu Arg Phe Leu Ala Gln Tyr Pro
1 5 10 15

Asp

<210> 993

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 993

His Ile Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Thr Tyr Thr
1 5 10 15

Pro

<210> 994

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 994

Ser Gln Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Ser Tyr Lys
1 5 10 15

Ala

<210> 995

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 995

Gln Ile Asp Asn Thr Ala Trp Tyr Glu Arg Phe Leu Leu Gln Tyr Asn
1 5 10 15

Ala

<210> 996

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 996

Asn Gln Asp Asn Thr Ala Trp Tyr Glu Ser Phe Leu Leu Gln Tyr Asn
1 5 10 15

Thr

<210> 997

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 997

Thr Ile Asp Asn Thr Ala Trp Tyr Glu Asn Phe Leu Leu Asn His Asn
1 5 10 15

Leu

<210> 998

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 998

His Tyr Asp Asn Thr Ala Trp Tyr Glu Arg Phe Leu Gln Gln Gly Trp
1 5 10 15

His

<210> 999

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 999

Glu Thr Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 1000

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 1000

Tyr Ile Pro Phe Thr Trp Glu Glu Ser Asn Ala Tyr Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 1001

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 1001

Asp Gly Tyr Asp Arg Trp Arg Gln Ser Gly Glu Arg Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu
20

<210> 1002

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=phosphotyrosine

<220>

<223> At position 2, Xaa=naphthylalanine

<220>

<223> At position 3, Xaa=phosphotyrosine

<220>

<223> At position 5, Xaa is an azetidine residue

<400> 1002

Xaa Xaa Xaa Gln Xaa Tyr Ala Leu Pro Leu

1

5

10

<210> 1003

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 1003

Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro

1

5

10

15

Tyr Ala Leu Pro Leu

20

<210> 1004

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 1004

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr Ala Leu Pro Leu

1

5

10

15

<210> 1005

<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<400> 1005
Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu Ser
1 5 10 15

Asp Asn His

<210> 1006
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa=azetidine

<400> 1006
Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr Ala Leu Pro Leu
1 5 10 15

<210> 1007
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 10, Xaa=azetidine

<400> 1007

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 1008

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1008

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 1009

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1009

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr
1 5 10

<210> 1010

<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 1, Xaa=acetylated phe

<220>
<223> At position 10, Xaa=azetidine

<400> 1010
Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr
1 5 10

<210> 1011
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>
<223> At position 1, Xaa=acetylated phe

<220>
<223> At position 10, Xaa=azetidine

<400> 1011
Phe Glu Trp Thr Pro Ala Tyr Trp Gln Xaa Tyr
1 5 10

<210> 1012
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:IL-1 ANTAGONIST

PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1012

Phe	Glu	Trp	Thr	Pro	Ala	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 1013

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1013

Phe	Glu	Trp	Thr	Pro	Ala	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 1014

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 1014

Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr Ala Leu Pro Leu
1 5 10 15

<210> 1015

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 1015

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr Ala Leu Pro Leu
1 5 10 15

<210> 1016

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 10, Xaa=azetidine

<400> 1016

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr Ala Leu Pro Leu
1 5 10 15

<210> 1017

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

PEPTIDE

<400> 1017

Thr Ala Asn Val Ser Ser Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro
1 5 10 15

Tyr Ala Leu Pro Leu

20

<210> 1018

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1018

Phe Glu Trp Thr Pro Gly Tyr Trp Gln Xaa Tyr
1 5 10

<210> 1019

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1019

Phe Glu Trp Thr Pro Gly Trp Tyr Gln Xaa Tyr
1 5 10

<210> 1020

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 10, Xaa=azetidine

<400> 1020

Phe Glu Trp Thr Pro Gly Tyr Tyr Gln Xaa Tyr
1 5 10

<210> 1021

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa=azetidine

<400> 1021

Phe Glu Trp Thr Pro Ala Tyr Trp Gln Xaa Tyr
1 5 10

<210> 1022

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa=azetidine

<400> 1022

Phe	Glu	Trp	Thr	Pro	Ala	Trp	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 1023

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PEPTIDE

<220>

<223> At position 1, Xaa=acetylated phe

<220>

<223> At position 6, D amino acid residue

<220>

<223> At position 10, Xaa=azetidine

<400> 1023

Phe	Glu	Trp	Thr	Pro	Ala	Tyr	Tyr	Gln	Xaa	Tyr
1				5					10	

<210> 1024

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1024

Gly	Gly	Leu	Tyr	Leu	Cys	Arg	Phe	Gly	Pro	Val	Thr	Trp	Asp	Cys	Gly
1				5					10					15	

Tyr	Lys	Gly	Gly
			20

<210> 1025

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1025

Gly	Gly	Thr	Tyr	Ser	Cys	His	Phe	Gly	Pro	Leu	Thr	Trp	Val	Cys	Lys
1				5					10					15	

Pro	Gln	Gly	Gly
			20

<210> 1026

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO-MIMETIC
PEPTIDE

<400> 1026

Gly Gly Asp Tyr His Cys Arg Met Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Leu Gly Gly
20

<210> 1027

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1027

Cys Gly Arg Glu Cys Pro Arg Leu Cys Gln Ser Ser Cys
1 5 10

<210> 1028

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1028

Cys Asn Gly Arg Cys Val Ser Gly Cys Ala Gly Arg Cys
1 5 10

<210> 1029

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1029

Val Gly Asn Tyr Met Cys His Phe Gly Pro Ile Thr Trp Val Cys Arg
1 5 10 15

Pro Gly Gly Gly
20

<210> 1030

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1030

Gly Gly Val Tyr Ala Cys Arg Met Gly Pro Ile Thr Trp Val Cys Ser
1 5 10 15

Pro Leu Gly Gly
20

<210> 1031

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1031

Cys Asn Gly Arg Cys
1 5

<210> 1032

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TPO MIMETIC

<400> 1032

Cys Asp Cys Arg Gly Asp Cys Phe Cys

1

5

<210> 1033

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1033

Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu Ala Ala Arg Ala Gly Gly

1

5

10

15

Gly Gly Gly Phe

20

<210> 1034

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1034

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys

1

5

10

15

Pro Gln Gly Gly Gly Gly Gly Gly Phe

20

25

<210> 1035

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1035

Val Gly Asn Tyr Met Ala His Met Gly Pro Ile Thr Trp Val Cys Arg
1 5 10 15

Pro Gly Gly

<210> 1036

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1036

Gly Gly Thr Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10 15

Pro Gln

<210> 1037

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1037

Gly Gly Leu Tyr Ala Cys His Met Gly Pro Met Thr Trp Val Cys Gln
1 5 10 15

Pro Leu Arg Gly
20

<210> 1038

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1038

Thr Ile Ala Gln Tyr Ile Cys Tyr Met Gly Pro Glu Thr Trp Glu Cys
1 5 10 15

Arg Pro Ser Pro Lys Ala
20

<210> 1039

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC

<400> 1039

Tyr Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10

<210> 1040

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1040

Tyr Cys His Phe Gly Pro Leu Thr Trp Val Cys
1 5 10

<210> 1041

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1041

Ser Cys His Phe Gly Pro Leu Thr Trp Val Cys Lys
1 5 10

<210> 1042

<211> 40

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1042

Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly
1 5 10 15

Pro Xaa Xaa Xaa Xaa Xaa Xaa Thr Trp Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
35 40

<210> 1043

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:EPO MIMETIC
PEPTIDE

<400> 1043

Asp Leu Xaa Xaa Leu
1 5

<210> 1044

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1044

Arg Thr Asp Leu Asp Ser Leu Arg Thr Tyr Thr Leu
1 5 10

<210> 1045

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF ANTAGONIST

<400> 1045

Phe Gly Gly Gly Gly Gly Asp Phe Leu Pro His Tyr Lys Asn Thr Ser
1 5 10 15

Leu Gly His Arg Pro
20

<210> 1046

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF ANTAGONIST

<400> 1046

Asp Phe Leu Pro His Tyr Lys Asn Thr Ser Leu Gly His Arg Pro Gly
1 5 10 15

Gly Gly Gly Gly Phe
20

<210> 1047

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

<400> 1047

Phe	Gly	Gly	Gly	Gly	Gly	Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Trp	Gln	Pro
1				5					10					15	

Tyr	Ala	Leu	Pro	Leu
		20		

<210> 1048

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:IL-1 ANTAGONIST

<400> 1048

Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Trp	Gln	Pro	Tyr	Ala	Leu	Pro	Leu	Gly
1				5				10						15	

Gly	Gly	Gly	Gly	Phe
			20	

<210> 1049

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST

<400> 1049

Phe	Gly	Gly	Gly	Gly	Gly	Val	Glu	Pro	Asn	Cys	Asp	Ile	His	Val	Met
1				5					10					15	

Trp	Glu	Trp	Glu	Cys	Phe	Glu	Arg	Leu
			20				25	

<210> 1050

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST

<400> 1050

Val	Glu	Pro	Asn	Cys	Asp	Ile	His	Val	Met	Trp	Glu	Trp	Glu	Cys	Phe
1				5					10					15	

Glu	Arg	Leu	Gly	Gly	Gly	Gly	Gly	Phe
			20					25

<210> 1051

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMP INHIBITOR

<400> 1051

Phe	Gly	Gly	Gly	Gly	Gly	Cys	Thr	Thr	His	Trp	Gly	Phe	Thr	Leu	Cys
1					5					10				15	

<210> 1052

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMP INHIBITOR

<400> 1052

Cys	Thr	Thr	His	Trp	Gly	Phe	Thr	Leu	Cys	Gly	Gly	Gly	Gly	Gly	Phe
1					5					10				15	

<210> 1053

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1053

Arg Thr Asp Leu Asp Ser Leu Arg Thr Tyr
1 5 10

<210> 1054

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1054

Arg Thr Asp Leu Asp Ser Leu Arg Thr
1 5

<210> 1055

<211> 757

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TNF-ALPHA
INHIBITOR

<220>

<221> CDS

<222> (4)..(747)

<400> 1055

cat atg gac aaa act cac aca tgt cca cct tgt cca gct ccg gaa ctc 48
Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
1 5 10 15ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc 96
Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr

	20	25	30	
ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg				144
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val				
	35	40	45	
agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg				192
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val				
	50	55	60	
gag gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc				240
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser				
	65	70	75	
acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg				288
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu				
	80	85	90	95
aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc				336
Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala				
	100	105	110	
ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca				384
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro				
	115	120	125	
cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag				432
Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln				
	130	135	140	
gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc				480
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala				
	145	150	155	
gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg				528
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr				
	160	165	170	175
cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc				576
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu				
	180	185	190	
acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc				624
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser				
	195	200	205	
gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc				672
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser				

210 215 220
 ctg tct ccg ggt aaa ggt gga ggt ggt ggt gac ttc ctg ccg cac tac 720
 Leu Ser Pro Gly Lys Gly Gly Gly Gly Gly Asp Phe Leu Pro His Tyr
 225 230 235

aaa aac acc tct ctg ggt cac cgt ccg taatggatcc 757
 Lys Asn Thr Ser Leu Gly His Arg Pro
 240 245

<210> 1056

<211> 248

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TNF-ALPHA
 INHIBITOR

<400> 1056

Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
 1 5 10 15

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
 35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
 100 105 110

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
 115 120 125

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
 130 135 140

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
 145 150 155 160

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
 165 170 175
 Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
 180 185 190
 Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
 195 200 205
 Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
 210 215 220
 Ser Pro Gly Lys Gly Gly Gly Gly Gly Asp Phe Leu Pro His Tyr Lys
 225 230 235 240
 Asn Thr Ser Leu Gly His Arg Pro
 245

<210> 1057

<211> 761

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ALPH
INHIBITOR Fc

<220>

<221> CDS

<222> (4)..(747)

<400> 1057

cat atg gac ttc ctg ccg cac tac aaa aac acc tct ctg ggt cac cgt	48
Met Asp Phe Leu Pro His Tyr Lys Asn Thr Ser Leu Gly His Arg	
1 5 10 15	
ccg ggt gga ggc ggt ggg gac aaa act cac aca tgt cca cct tgc cca	96
Pro Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro	
20 25 30	
gca cct gaa ctc ctg ggg gga ccg tca gtt ttc ctc ttc ccc cca aaa	144
Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys	
35 40 45	
ccc aag gac acc ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg	192

Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val	
50 55 60	
gtg gtg gac gtg agc cac gaa gac cct gag gtc aag ttc aac tgg tac	240
Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr	
65 70 75	
gtg gac ggc gtg gag gtg cat aat gcc aag aca aag ccg cgg gag gag	288
Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu	
80 85 90 95	
cag tac aac agc acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac	336
Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His	
100 105 110	
cag gac tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc aac aaa	384
Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys	
115 120 125	
gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag	432
Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln	
130 135 140	
ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg	480
Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu	
145 150 155	
acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc	528
Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro	
160 165 170 175	
agc gac atc gcc gtg gag tgg gag agc aat ggg cag ccg gag aac aac	576
Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn	
180 185 190	
tac aag acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc	624
Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu	
195 200 205	
tac agc aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac gtc	672
Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val	
210 215 220	
ttc tca tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg cag	720
Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln	
225 230 235	
aag agc ctc tcc ctg tct ccg ggt aaa taatggatcc gcgg	761

Lys Ser Leu Ser Leu Ser Pro Gly Lys
240 245

<210> 1058

<211> 248

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:TNF-ALPH
INHIBITOR Fc

<400> 1058

Met Asp Phe Leu Pro His Tyr Lys Asn Thr Ser Leu Gly His Arg Pro
1 5 10 15

Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
20 25 30

Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
35 40 45

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
50 55 60

Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
65 70 75 80

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
85 90 95

Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
100 105 110

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
115 120 125

Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
130 135 140

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr
145 150 155 160

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
165 170 175

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
180 185 190

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
 195 200 205

Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
 210 215 220

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
 225 230 235 240

Ser Leu Ser Leu Ser Pro Gly Lys
 245

<210> 1059

<211> 763

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc IL-1
 ANTAGONIST

<220>

<221> CDS

<222> (4)..(747)

<400> 1059

cat atg gac aaa act cac aca tgt cca cct tgt cca gct ccg gaa ctc 48
 Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 1 5 10 15

ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc 96
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 20 25 30

ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg 144
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 35 40 45

agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg 192
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 50 55 60

gag gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc 240
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 65 70 75

acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg 288
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 80 85 90 95

aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc 336
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 100 105 110

ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca 384
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 115 120 125

cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag 432
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 130 135 140

gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc 480
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 145 150 155

gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg 528
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 160 165 170 175

cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc 576
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 180 185 190

acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc 624
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 195 200 205

gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc 672
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 210 215 220

ctg tct ccg ggt aaa ggt gga ggt ggt ggt ttc gaa tgg acc ccg ggt 720
 Leu Ser Pro Gly Lys Gly Gly Gly Gly Gly Phe Glu Trp Thr Pro Gly
 225 230 235

tac tgg cag ccg tac gct ctg ccg ctg taatggatcc ctcgag 763
 Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
 240 245

<210> 1060..

<211> 248

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc IL-1
ANTAGONIST

<400> 1060

Met	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu
1				5					10					15	

Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu
			20					25					30		

Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser
		35					40					45			

His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu
	50					55					60				

Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr
65					70					75					80

Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn
			85						90					95	

Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro
		100							105				110		

Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln
	115						120					125			

Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val
	130					135					140				

Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val
145					150					155					160

Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro
			165						170					175	

Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr
			180					185					190		

Val	Asp	Lys	Ser	Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val
	195						200					205			

Met	His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu
	210					215					220				

Ser	Pro	Gly	Lys	Gly	Gly	Gly	Gly	Gly	Phe	Glu	Trp	Thr	Pro	Gly	Tyr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

225

230

235

240

Trp Gln Pro Tyr Ala Leu Pro Leu

245

<210> 1061

<211> 757

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: IL-1 ANTAGONIST
Fc

<220>

<221> CDS

<222> (4) .. (747)

<400> 1061

cat	atg	ttc	gaa	tgg	acc	ccg	ggg	tac	tgg	cag	ccg	tac	gct	ctg	ccg	48
Met	Phe	Glu	Trp	Thr	Pro	Gly	Tyr	Trp	Gln	Pro	Tyr	Ala	Leu	Pro		
1				5					10					15		

ctg	ggg	gga	ggc	ggg	gac	aaa	act	cac	aca	tgt	cca	cct	tgc	cca	96
Leu	Gly	Gly	Gly	Gly	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	
			20					25					30		

gca	cct	gaa	ctc	ctg	ggg	gga	ccg	tca	gtt	ttc	ctc	ttc	ccc	cca	aaa	144
Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	
			35					40					45			

ccc	aag	gac	acc	ctc	atg	atc	tcc	cgg	acc	cct	gag	gtc	aca	tgc	gtg	192
Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	
			50				55					60				

gtg	gtg	gac	gtg	agc	cac	gaa	gac	cct	gag	gtc	aag	ttc	aac	tgg	tac	240
Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	
			65				70					75				

gtg	gac	ggc	gtg	gag	gtg	cat	aat	gcc	aag	aca	aag	ccg	cgg	gag	gag	288
Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	
			80				85				90				95	

cag	tac	aac	agc	acg	tac	cgt	gtg	gtc	agc	gtc	ctc	acc	gtc	ctg	cac	336
Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	
							100				105				110	

cag gac tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc aac aaa 384
 Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys
 115 120 125

 gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag 432
 Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln
 130 135 140

 ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg 480
 Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu
 145 150 155

 acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc 528
 Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro
 160 165 170 175

 agc gac atc gcc gtg gag tgg gag agc aat ggg cag ccg gag aac aac 576
 Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn
 180 185 190

 tac aag acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc 624
 Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu
 195 200 205

 tac agc aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac gtc 672
 Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val
 210 215 220

 ttc tca tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg cag 720
 Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln
 225 230 235

 aag agc ctc tcc ctg tct ccg ggt aaa taatggatcc 757
 Lys Ser Leu Ser Leu Ser Pro Gly Lys
 240 245

<210> 1062

<211> 248

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: IL-1 ANTAGONIST

Fc

<400> 1062

Met Phe Glu Trp Thr Pro Gly Tyr Trp Gln Pro Tyr Ala Leu Pro Leu
 1 5 10 15

Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
 20 25 30

Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
 35 40 45

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
 50 55 60

Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
 65 70 75 80

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
 85 90 95

Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
 100 105 110

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
 115 120 125

Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
 130 135 140

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr
 145 150 155 160

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
 165 170 175

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
 180 185 190

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
 195 200 205

Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
 210 215 220

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
 225 230 235 240

Ser Leu Ser Leu Ser Pro Gly Lys
 245

<210> 1063
 <211> 773
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Fc-VEGF
 ANTAGONIST

<220>
 <221> CDS
 <222> (4)..(759)

<400> 1063
 cat atg gac aaa act cac aca tgt cca ccg tgc cca gca cct gaa ctc 48
 Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 1 5 10 15
 ctg ggg gga ccg tca gtt ttc ctc ttc ccc cca aaa ccc aag gac acc 96
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 20 25 30
 ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg 144
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 35 40 45
 agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg 192
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 50 55 60
 gag gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc 240
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 65 70 75
 acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg 288
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 80 85 90 95
 aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc 336
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 100 105 110
 ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca 384
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 115 120 125
 cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag 432
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln

130	135	140	
gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc			480
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala			
145	150	155	
gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg			528
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr			
160	165	170	175
cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc			576
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu			
180	185	190	
acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc			624
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser			
195	200	205	
gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc			672
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser			
210	215	220	
ctg tct ccg ggt aaa ggt ggt ggt ggt ggt gtt gaa ccg aac tgt gac			720
Leu Ser Pro Gly Lys Gly Gly Gly Gly Gly Val Glu Pro Asn Cys Asp			
225	230	235	
atc cat gtt atg tgg gaa tgg gaa tgt ttt gaa cgt ctg taactcgagg			769
Ile His Val Met Trp Glu Trp Glu Cys Phe Glu Arg Leu			
240	245	250	
atcc			773

<210> 1064

<211> 252

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-VEGF
ANTAGONIST

<400> 1064

Met	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu
1				5					10					15	

Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu
		20						25					30		

Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

35	40	45
His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu		
50	55	60
Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr		
65	70	75
Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn		
85	90	95
Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro		
100	105	110
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln		
115	120	125
Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val		
130	135	140
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val		
145	150	155
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro		
165	170	175
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr		
180	185	190
Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val		
195	200	205
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu		
210	215	220
Ser Pro Gly Lys Gly Gly Gly Gly Gly Val Glu Pro Asn Cys Asp Ile		
225	230	235
His Val Met Trp Glu Trp Glu Cys Phe Glu Arg Leu		
245	250	

<210> 1065

<211> 773

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: VEGF ANTAGONIST

Fc

<220>

<221> CDS

<222> (4)..(759)

<400> 1065

cat atg gtt gaa ccg aac tgt gac atc cat gtt atg tgg gaa tgg gaa	48
Met Val Glu Pro Asn Cys Asp Ile His Val Met Trp Glu Trp Glu	
1 5 10 15	
tgt ttt gaa cgt ctg ggt ggt ggt ggt ggt gac aaa act cac aca tgt	96
Cys Phe Glu Arg Leu Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys	
20 25 30	
cca ccg tgc cca gca cct gaa ctc ctg ggg gga ccg tca gtt ttc ctc	144
Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu	
35 40 45	
ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct gag	192
Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu	
50 55 60	
gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc aag	240
Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys	
65 70 75	
ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca aag	288
Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys	
80 85 90 95	
ccg cgg gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc ctc	336
Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu	
100 105 110	
acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc aag	384
Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys	
115 120 125	
gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa	432
Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys	
130 135 140	
gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc	480
Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser	
145 150 155	

cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa 528
 Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
 160 165 170 175

 ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg cag 576
 Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
 180 185 190

 ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac ggc 624
 Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
 195 200 205

 tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg cag 672
 Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
 210 215 220

 cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac aac 720
 Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
 225 230 235

 cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa taactcgagg 769
 His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 240 245 250

 atcc 773

<210> 1066

<211> 252

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: VEGF ANTAGONIST

Fc

<400> 1066

Met Val Glu Pro Asn Cys Asp Ile His Val Met Trp Glu Trp Glu Cys
 1 5 10 15

Phe Glu Arg Leu Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro
 20 25 30

Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe
 35 40 45

Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val
 50 55 60

Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe
 65 70 75 80

Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro
 85 90 95

Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr
 100 105 110

Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val
 115 120 125

Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala
 130 135 140

Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg
 145 150 155 160

Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly
 165 170 175

Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro
 180 185 190

Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser
 195 200 205

Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln
 210 215 220

Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His
 225 230 235 240

Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 245 250

<210> 1067

<211> 748

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-MMP
 INHIBITOR

<220>

<221> CDS

<222> (4)..(732)

<400> 1067

cat atg gac aaa act cac aca tgt cca cct tgt cca gct ccg gaa ctc	48
Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu	
1 5 10 15	
ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc	96
Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr	
20 25 30	
ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg	144
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val	
35 40 45	
agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg	192
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val	
50 55 60	
gag gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc	240
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser	
65 70 75	
acg tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg	288
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu	
80 85 90 95	
aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc	336
Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala	
100 105 110	
ccc atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca	384
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro	
115 120 125	
cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag	432
Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln	
130 135 140	
gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc	480
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala	
145 150 155	
gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg	528
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr	
160 165 170 175	

cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc 576
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 180 185 190

acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc 624
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 195 200 205

gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc 672
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 210 215 220

ctg tct ccg ggt aaa ggt gga ggt ggt ggt tgc acc acc cac tgg ggt 720
 Leu Ser Pro Gly Lys Gly Gly Gly Gly Gly Cys Thr Thr His Trp Gly
 225 230 235

ttc acc ctg tgc taatggatcc ctcgag 748
 Phe Thr Leu Cys
 240

<210> 1068

<211> 243

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-MMP
 INHIBITOR

<400> 1068

Met Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
 1 5 10 15

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 20 25 30

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
 35 40 45

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 50 55 60

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 65 70 75 80

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
 85 90 95

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro

100	105	110
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln		
115	120	125
Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val		
130	135	140
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val		
145	150	155
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro		
165	170	175
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr		
180	185	190
Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val		
195	200	205
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu		
210	215	220
Ser Pro Gly Lys Gly Gly Gly Gly Gly Cys Thr Thr His Trp Gly Phe		
225	230	235
240		
Thr Leu Cys		

<210> 1069

<211> 763

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMP INHIBITOR

Fc

<220>

<221> CDS

<222> (4) .. (753)

<400> 1069

cat atg tgc acc acc cac tgg ggt ttc acc ctg tgc ggt gga ggc ggt 48

Met Cys Thr Thr His Trp Gly Phe Thr Leu Cys Gly Gly Gly Gly

1

5

10

15

ggg gac aaa ggt gga ggc ggt ggg gac aaa act cac aca tgt cca cct	96
Gly Asp Lys Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro	
20 25 30	
tgc cca gca cct gaa ctc ctg ggg gga ccg tca gtt ttc ctc ttc ccc	144
Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro	
35 40 45	
cca aaa ccc aag gac acc ctc atg atc tcc cgg acc cct gag gtc aca	192
Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr	
50 55 60	
tgc gtg gtg gtg gac gtg agc cac gaa gac cct gag gtc aag ttc aac	240
Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn	
65 70 75	
tgg tac gtg gac ggc gtg gag gtg cat aat gcc aag aca aag ccg cgg	288
Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg	
80 85 90 95	
gag gag cag tac aac agc acg tac cgt gtg gtc agc gtc ctc acc gtc	336
Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val	
100 105 110	
ctg cac cag gac tgg ctg aat ggc aag gag tac aag tgc aag gtc tcc	384
Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser	
115 120 125	
aac aaa gcc ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc aaa	432
Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys	
130 135 140	
ggg cag ccc cga gaa cca cag gtg tac acc ctg ccc cca tcc cgg gat	480
Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp	
145 150 155	
gag ctg acc aag aac cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc	528
Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe	
160 165 170 175	
tat ccc agc gac atc gcc gtg gag tgg gag agc aat ggg cag ccg gag	576
Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu	
180 185 190	
aac aac tac aag acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc	624
Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe	
195 200 205	

ttc ctc tac agc aag ctc acc gtg gac aag agc agg tgg cag cag ggg 672
 Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly
 210 215 220

aac gtc ttc tca tgc tcc gtg atg cat gag gct ctg cac aac cac tac 720
 Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
 225 230 235

acg cag aag agc ctc tcc ctg tct ccg ggt aaa taatggatcc 763
 Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 240 245 250

<210> 1070

<211> 250

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:MMP INHIBITOR

Fc

<400> 1070

Met Cys Thr Thr His Trp Gly Phe Thr Leu Cys Gly Gly Gly Gly Gly
 1 5 10 15

Asp Lys Gly Gly Gly Gly Gly Asp Lys Thr His Thr Cys Pro Pro Cys
 20 25 30

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
 35 40 45

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
 50 55 60

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
 65 70 75 80

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
 85 90 95

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
 100 105 110

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
 115 120 125

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
 130 135 140

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
145 150 155 160

Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
165 170 175

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
180 185 190

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
195 200 205

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
210 215 220

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
225 230 235 240

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
245 250

<210> 1071

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE.

<400> 1071

Cys Gly Arg Glu Cys Pro Arg Leu Cys Gln Ser Ser Cys
1 5 10

<210> 1072

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1072

Cys Asn Gly Arg Cys Val Ser Gly Cys Ala Gly Arg Cys
1 5 10

<210> 1073

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1073

Cys Leu Ser Gly Ser Leu Ser Cys
1 5

<210> 1074

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1074

Asn Gly Arg Ala His Ala
1 5

<210> 1075

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<220>

<221> CDS

<222> (10)..(189)

<400> 1075

Cys Asn Gly Arg Cys

1

5

<210> 1076

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1076

Cys Asp Cys Arg Gly Asp Cys Phe Cys

1

5

<210> 1077

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1077

Cys Gly Ser Leu Val Arg Cys

1

5

<210> 1078

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1078

Arg Thr Asp Leu Asp Ser Leu Arg

1

5

<210> 1079

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:INTEGRIN
BINDING PEPTIDE

<400> 1079

Gly Asp Leu Asp Leu Leu Lys Leu Arg Leu Thr Leu
1 5 10

<210> 1080

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 1080

Gly Asp Leu His Ser Leu Arg Gln Leu Leu Ser Arg
1 5 10

<210> 1081

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial
Sequence:INTEGRIN-BINDING PEPTIDE

<400> 1081

Arg Asp Asp Leu His Met Leu Arg Leu Gln Leu Trp
1 5 10

<210> 1082

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 1082

Ser Ser Asp Leu His Ala Leu Lys Lys Arg Tyr Gly
1 5 10

<210> 1083

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 1083

Arg Gly Asp Leu Lys Gln Leu Ser Glu Leu Thr Trp
1 5 10

<210> 1084

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial

Sequence:INTEGRIN-BINDING PEPTIDE

<400> 1084

Arg Gly Asp Leu Ala Ala Leu Ser Ala Pro Pro Val
1 5 10

<210> 1085

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ANTAGONIST
PEPTIDE

<400> 1085

Asp Phe Leu Pro His Tyr Lys Asn Thr Ser Leu Gly His Arg Pro
1 5 10 15

<210> 1086

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1086

Gly Glu Arg Trp Cys Phe Asp Gly Pro Leu Thr Trp Val Cys Gly Glu
1 5 10 15

Glu Ser

<210> 1087

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1087

Arg Gly Trp Val Glu Ile Cys Val Ala Asp Asp Asn Gly Met Cys Val
1 5 10 15

Thr Glu Ala Gln
20

<210> 1088

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1088

Gly Trp Asp Glu Cys Asp Val Ala Arg Met Trp Glu Trp Glu Cys Phe
1 5 10 15

Ala Gly Val

<210> 1089

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1089

Arg Gly Trp Val Glu Ile Cys Glu Ser Asp Val Trp Gly Arg Cys Leu
1 5 10 15

<210> 1090

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VEGF ANTAGONIST
PEPTIDE

<400> 1090

Arg Gly Trp Val Glu Ile Cys Glu Ser Asp Val Trp Gly Arg Cys Leu
1 5 10 15

<210> 1091
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VEGF ANTAGONIST
PEPTIDE

<400> 1091
Gly Gly Asn Glu Cys Asp Ile Ala Arg Met Trp Glu Trp Glu Cys Phe
1 5 10 15

Glu Arg Leu

<210> 1092
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VEGF ANTAGONIST
PEPTIDE

<400> 1092
Arg Gly Trp Val Glu Ile Cys Ala Ala Asp Asp Tyr Gly Arg Cys Leu
1 5 10 15

<210> 1093
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MMP INHIBITOR
PEPTIDE

<400> 1093
Cys Leu Arg Ser Gly Xaa Gly Cys
1 5

<210> 1094
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MMP INHIBITOR
PEPTIDE

<400> 1094
Cys Xaa Xaa His Trp Gly Phe Xaa Xaa Cys
1 5 10

<210> 1095
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MMP INHIBITOR
PEPTIDE

<400> 1095
Cys Xaa Pro Xaa Cys
1 5

<210> 1096
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MMP INHIBITOR
PEPTIDE

<400> 1096
Cys Arg Arg His Trp Gly Phe Glu Phe Cys
1 5 10

<210> 1097
<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMP INHIBITOR
PEPTIDE

<400> 1097

Ser Thr Thr His Trp Gly Phe Thr Leu Ser
1 5 10

<210> 1098

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMP INHIBITOR
PEPTIDE

<400> 1098

Cys Ser Leu His Trp Gly Phe Trp Trp Cys
1 5 10

<210> 1099

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:CARBOHYDRATE
(GD1 ALPHA) MIMETIC PEPTIDE

<400> 1099

Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly Arg
1 5 10 15

<210> 1100

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PEPTIDE

<400> 1100

Leu Lys Thr Pro Arg Val
1 5

<210> 1101

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PEPTIDE

<400> 1101

Asn Thr Leu Lys Thr Pro Arg Val
1 5

<210> 1102

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PROTEIN

<400> 1102

Asn Thr Leu Lys Thr Pro Arg Val Gly Gly Cys
1 5 10

<210> 1103

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PROTEIN

<400> 1103

Lys Asp Lys Ala Thr Phe

1

5

<210> 1104

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-1 GP1AB
BINDING PROTEIN

<400> 1104

Lys Asp Lys Ala Thr Phe Gly Cys His Asp

1

5

10

<210> 1105

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PEPTIDE

<400> 1105

Lys Asp Lys Ala Thr Phe Gly Cys His Asp Gly Cys

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5

10

<210> 1106

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PROTEIN

<400> 1106

Thr Leu Arg Val Tyr Lys

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<210> 1107

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PROTEIN

<400> 1107

Ala Thr Leu Arg Val Tyr Lys Gly Gly

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<210> 1108

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BETA-2 GP1AB
BINDING PROTEIN

<400> 1108

Cys Ala Thr Leu Arg Val Tyr Lys Gly Gly

1

5

10

<210> 1109

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MEMBRANE
TRANSPORTING PEPTIDE

<400> 1109

Ile Asn Leu Lys Ala Leu Ala Ala Leu Ala Lys Lys Ile Leu

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5

10

<210> 1110
<211> 12
<212> PRT
<213> Artificial Sequence

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1 5 10

<210> 1111
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MEMBRANE
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1 5 10 15

Lys Ala Leu Ala Ala Leu Ala Lys Lys Ile Leu
20 25

<210> 1112
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:FC PCR PRIMER

<400> 1112
aacataagta cctgtaggat cg

22

<210> 1113
<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-TNF ALPHA
PCR PRIMER

<220>

<221> CDS

<222> (1)..(126)

<400> 1113

ccg	cgg	atc	cat	tac	gga	cgg	tga	ccc	aga	gag	gtg	ttt	ttg	tag	tgc	48
Pro	Arg	Ile	His	Tyr	Gly	Arg		Pro	Arg	Glu	Val	Phe	Leu		Cys	
1					5			10						15		

ggc	agg	aag	tca	cca	cca	cct	cca	cct	tta	ccc	81
Gly	Arg	Lys	Ser	Pro	Pro	Pro	Pro	Pro	Leu	Pro	
			20					25			

<210> 1114

<211> 7

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TNF ALPHA
PCR PRIMER

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1					5	

<210> 1115

<211> 6

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TNF ALPHA
PCR PRIMER

<400> 1115

Pro	Arg	Glu	Val	Phe	Leu
1				5	

<210> 1116

<211> 12

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Fc-TNF ALPHA
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1 5 10

<210> 1117

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:TNF-ALPHA
INHIBITOR-Fc PCR PRIMER

<400> 1117

gaataacata tggacttcct gccgcactac aaaaacacct ctctgggtca ccgtccgggt 60
ggaggcggtg ggacaaaac t 81

<210> 1118

<211> 81

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
PCR PRIMER

<400> 1118

ccgcggatcc attacagcgg cagagcgtac ggctgccagt aaccgggggt ccattcgaaa 60
ccaccacctc cacctttacc c 81

<210> 1119

<211> 81

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:IL-1 ANTAGONIST
-Fc PCR PRIMER

<400> 1119

gaataacata tggtcgaatg gaccccgggt tactggcagc cgtacgctct gccgctgggt 60
ggaggcgggtg gggacaaaac t 81

<210> 1120

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-VEGF
ANTAGONIST OLIGONUCLEOTIDE

<400> 1120

gttgaaccga actgtgacat ccatgttatg tgggaatggg aatgttttga acgtctg 57

<210> 1121

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-VEGF
ANTAGONIST OLIGONUCLEOTIDE

<400> 1121

cagacgttca aaacattccc attcccacat aacatggatg tcacagttcg gttcaac 57

<210> 1122

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-VEGF
ANTAGONIST PCR TEMPLATE

<400> 1122

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<210> 1123

<211> 48

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Fc PRIMER

<400> 1123

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<210> 1124

<211> 51

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Fc PRIMER

<400> 1124

gtcacagttc ggttcaacac caccaccacc acctttaccc ggagacaggg a

51

<210> 1125

<211> 54

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:Fc-VEGF
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<210> 1126

<211> 39

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<213> Artificial Sequence

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<223> Description of Artificial Sequence:Fc-VEGF
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<400> 1126

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39

<210> 1127...

<211> 48

<212> DNA

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<220>

<223> Description of Artificial Sequence:Fc-VEGF
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<210> 1128

<211> 51

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<213> Artificial Sequence

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<223> Description of Artificial Sequence:Fc-VEGF
ANTAGONIST-Fc PCR PRIMER

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51

<210> 1129

<211> 51

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc-PCR PRIMER

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<210> 1130

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Fc PCR PRIMER

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<210> 1131

<211> 66
 <212> DNA
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<400> 1131
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 ttaccc 66

<210> 1132
 <211> 63
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 INHIBITOR-Fc PCR PRIMER

<400> 1132
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 aaa 63

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 <223> Description of Artificial Sequence:Fc-TMP

<400> 1133
 Lys Gly Gly Gly Gly Ile Glu Gly Pro Thr Leu Arg Gln Trp Leu
 1 5 10 15

Ala Ala Arg Ala
 20

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(71) Applicant: AMGEN INC. [US/US]: One Amgen Center
Drive, Thousand Oaks, CA 91320-1799 (US).

(72) Inventors: FEIGE, Ulrich: 3117 Deer Valley Av-
enue, Newbury Park, CA 91320 (US). LIU, Chuan-Fa;
1425 Clover Creek Drive, Longmont, CO 80503 (US).
CHEETHAM, Janet: 1695 East Valley Road, Montecito,
CA 93108 (US). BOONE, Thomas, Charles: 3010 Deer
Valley Avenue, Newbury Park, CA 91320 (US).

(74) Agents: ODRE, Steven, M. et al.: Amgen, Inc., One Am-
gen Center Drive, Thousand Oaks, CA 91320-1799 (US).

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IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,
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*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
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WO 00/24782 A3

(54) Title: MODIFIED PEPTIDES, COMPRISING AN FC DOMAIN, AS THERAPEUTIC AGENTS

(57) Abstract: The present invention concerns fusion of Fc domains with biologically active peptides and a process for preparing pharmaceutical agents using biologically active peptides. In this invention, pharmacologically active compounds are prepared by a process comprising: a) selecting at least one peptide that modulates the activity of a protein of interest; and b) preparing a pharmacologic agent comprising an Fc domain covalently linked to at least one amino acid of the selected peptide. Linkage to the vehicle increases the half-life of the peptide, which otherwise would be quickly degraded *in vivo*. The preferred vehicle is an Fc domain. The peptide is preferably selected by phage display, *E. coli* display, ribosome display, RNA-peptide screening, or chemical-peptide screening.

INTERNATIONAL SEARCH REPORT

In tional Application No

PCT/US 99/25044

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K19/00 C12N15/62 C12N15/70 C12N1/21

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

BIOSIS, EMBASE, WPI Data, PAJ, EPO-Internal, STRAND

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 46257 A (AMGEN INC.) 22 October 1998 (1998-10-22) page 3, line 12 -page 4, line 4 page 12, line 9 - line 25	1-3,5-7
Y	---	11-21,51
X	WO 96 18412 A (BETH ISRAEL HOSPITAL ASSOCIATION) 20 June 1996 (1996-06-20) page 8, line 14 -page 12, line 26 claims --- -/--	1-3,5,6, 22-24
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

18 October 2000

Date of mailing of the international search report

07.12.2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

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Nooij, F

INTERNATIONAL SEARCH REPORT

Int. Application No

PCT/US 99/25044

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 28828 A (AMGEN BOULDER INC.) 14 August 1997 (1997-08-14) page 5, line 23 - line 31 page 13, line 27 -page 14, line 5	1-3, 5, 6, 8, 22-25
Y		10, 11, 26-29, 34, 35, 40-51
X	WO 98 24477 A (AMGEN INC.) 11 June 1998 (1998-06-11) page 10, line 31 -page 11, line 13 page 22, line 10 - line 35	1-3, 5, 6, 8, 22-29, 35, 40-44, 46-51
X	WO 95 09917 A (THE REGENTS OF THE UNIVERSITY OF CALIFORNIA) 13 April 1995 (1995-04-13) figure 3 claims	1-5, 22-24
X	WO 97 44453 A (GENENTECH INC.) 27 November 1997 (1997-11-27) examples claims	1-6, 22-24
Y		36
X	H. LOETSCHER ET AL.: "Efficacy of a chimeric TNFR-IgG fusion protein to inhibit TNF activity in animal models of septic shock." INTERNATIONAL CONGRESS SERIES, vol. 2, 1993, pages 455-462, XP002067659 Amsterdam, The Netherlands the whole document	1, 2, 5, 22-24
Y		37
X	B. BROCKS ET AL.: "A TNF receptor antagonistic scFv, which is not secreted in mammalian cells, is expressed as a soluble mono- and bivalent scFv derivative in insect cells." IMMUNOTECHNOLOGY, vol. 3, no. 3, October 1997 (1997-10), pages 173-184, XP002147314 Amsterdam, The Netherlands abstract figure 1	1, 4-6, 22-24
Y		37
X	WO 98 31820 A (BORYUNG PHARMACEUTICAL CO. LTD.) 23 July 1998 (1998-07-23) the whole document	1-6, 22-24

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INTERNATIONAL SEARCH REPORT

International Application No

PC1/US 99/25044

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 767 234 A (YANOFSKY ET AL.) 16 June 1998 (1998-06-16) seq.id.nos. 10,17,46,259 column 8, line 54 - line 57 ---	10
Y	S. CWIRLA ET AL.: "Peptide agonists of the thrombopoietin receptor as potent as the natural cytokine." SCIENCE, vol. 276, no. 5319, 13 June 1997 (1997-06-13), pages 1696-1699, XP002142424 Washington, DC, USA cited in the application the whole document ---	18-21, 26-29, 33-37, 40-51
Y	WO 96 40772 A (JOHNSON & JOHNSON) 19 December 1996 (1996-12-19) claims 1-3 figure 9 ---	12-17,33
A	D. JOHNSON ET AL.: "Identification of a 13 amino acid peptide mimetic of erythropoietin and description of amino acids critical for the mimetic activity of EMP1." BIOCHEMISTRY, vol. 37, no. 11, 1998, pages 3699-3710, XP002147315 Washington, DC, USA abstract tables -----	12-17

INTERNATIONAL SEARCH REPORT

Int: ional application No.
PCT/US 99/25044

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,
no additional fees are to be refunded.

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7 (partially), 8-11 (completely),
22-32 (partially), 35 (completely),
39-51 (partially)

Compositions of matter of the formula (X1)a-F1-(X2)b and multimers thereof, wherein F1 is an Fc domain, X1 and X2 are each independently selected from -(L1)c-P1, -(L1)c-P1-(L2)d-P2, -(L1)c-P1-(L2)d-P2-(L3)e-P3, and -(L1)c-P1-(L2)d-P2-(L3)e-P3-(L4)f-P4. P1, P2, P3 and P4 are each independently sequences of pharmacologically active peptides; L1, L2, L3 and L4 are each independently linkers, and a, b, c, d and e are each independently 0 or 1, provided that at least one of a and b is 1; DNA encoding said composition, an expression vector comprising said DNA, a host cell comprising said expression vector, Process for preparing a pharmacologically active compound, and wherein X1 and X2 comprise an IL-1 antagonist peptide sequence.

2. Claims: 1-7 (partially), 12-17 (completely),
22-32 (partially), 33 (completely),
39-51 (partially)

As in subject 1, but wherein X1 and X2 comprise an EPO-mimetic peptide sequence.

3. Claims: 1-7 (partially), 18-21 (completely),
22-32 (partially), 34 (completely),
39-51 (partially)

As in subject 1, but wherein P1 is a TPO-mimetic peptide sequence

4. Claims: 26-32 (partially), 36 (completely),
39-51 (partially)

Process for preparing a pharmacologically active compound, which comprises selecting at least one randomized peptide that modulates the activity of a protein of interest, and preparing a pharmacologic agent comprising one Fc domain covalently linked to at least one amino acid sequence of the selected peptide(s); wherein said peptide is an MMP inhibitor peptide or a VEGF antagonist peptide.

5. Claims: 26-32 (partially), 37 (completely),

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

39-51 (partially)

As in subject 4, but wherein said peptide is a TNF antagonist peptide.

6. Claims: 26-32 (partially), 38 (completely),
39-51 (partially)

As in subject 4, but wherein said peptide is a CTLA4 mimetic peptide.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT, US 99/25044

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9846257 A	22-10-1998	AU 7132798 A EP 0977583 A ZA 9803239 A	11-11-1998 09-02-2000 29-10-1998
WO 9618412 A	20-06-1996	EP 0793504 A JP 11501506 T	10-09-1997 09-02-1999
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WO 9831820 A	23-07-1998	AU 5681498 A	07-08-1998
US 5767234 A	16-06-1998	US 5608035 A US 5880096 A US 5861476 A US 5786331 A AU 1872595 A WO 9520973 A ZA 9500788 A	04-03-1997 09-03-1999 19-01-1999 28-07-1998 21-08-1995 10-08-1995 08-02-1996
WO 9640772 A	19-12-1996	US 5767078 A AU 6100796 A CA 2228277 A EP 0892812 A	16-06-1998 30-12-1996 19-12-1996 27-01-1999

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